

December 16, 1963

Mr. Harry Gilbert  
Blonder-Tongue Electronics  
9 Ailing Street  
Newark 2, New Jersey

Re: U.S. Application S.N. 325,511  
for "Directive Antenna"  
(Blonder Schenfeld)

Dear Harry:

We enclose for your file a copy of the specification, claims and drawing in connection with the above-numbered application, which application was filed on November 21, 1963.

Yours very truly,

RINES AND RINES

RS/BD  
Enc.

cc: Mr. I. S. Blonder

By \_\_\_\_\_

P.S.

Dear Ike:

Bob plans to add claims directed to the modification shown him on December 4, 1963.

Add P15

IK:

Get plans to add  
Claims directed to the  
modification from him  
in December 4, 1963

Check Blade and  
in Log Periodic

To get better claim.  
Antenna vity. bad diagnosis

In Drive wheel test  
flashing.

Blade now to see  
some parallel array  
will have support.

Check the test again

Dec 4 1963

- Guy

In Blender new antenna applic. - ensure

a claim just to 11-structure without designing

end. Also make a claim with metal spars

(metal-wire means)

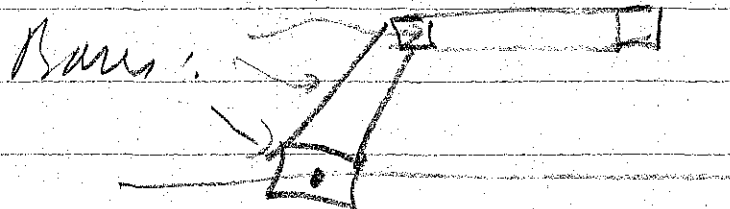
of 11-lines with means for support antenna

connected with at least one of spars means

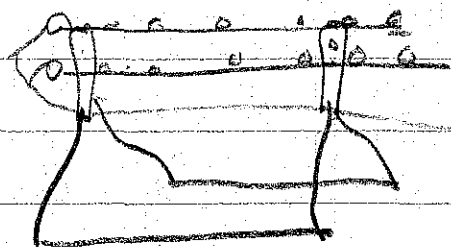
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DEC 10 1963

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Will generally cover also

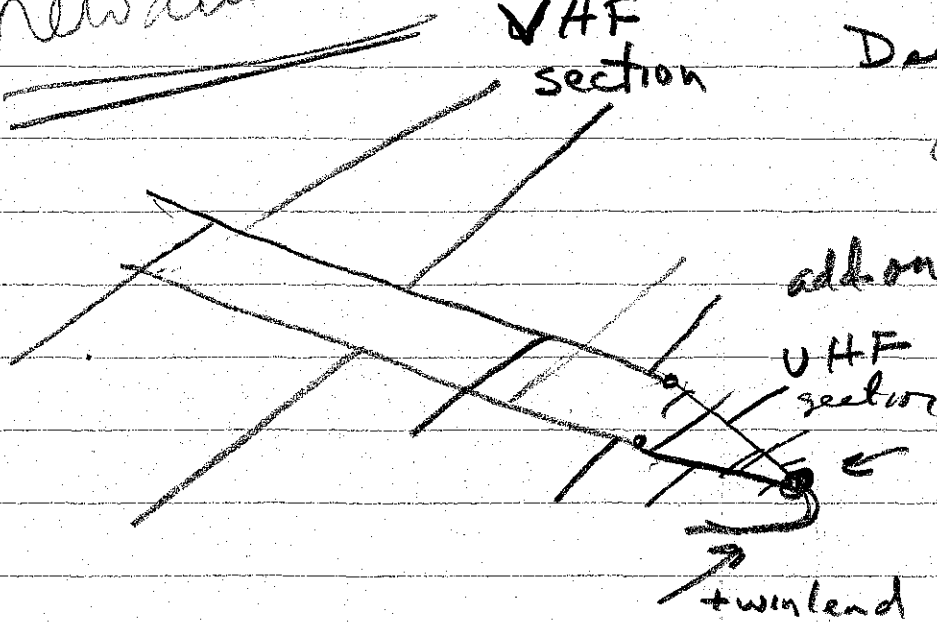


New disclosure:

VHF section

Dec 4 63

K3bl



Witnessed by model  
at DTI Normal  
Dec 4 63  
Rines

antenna element clamp

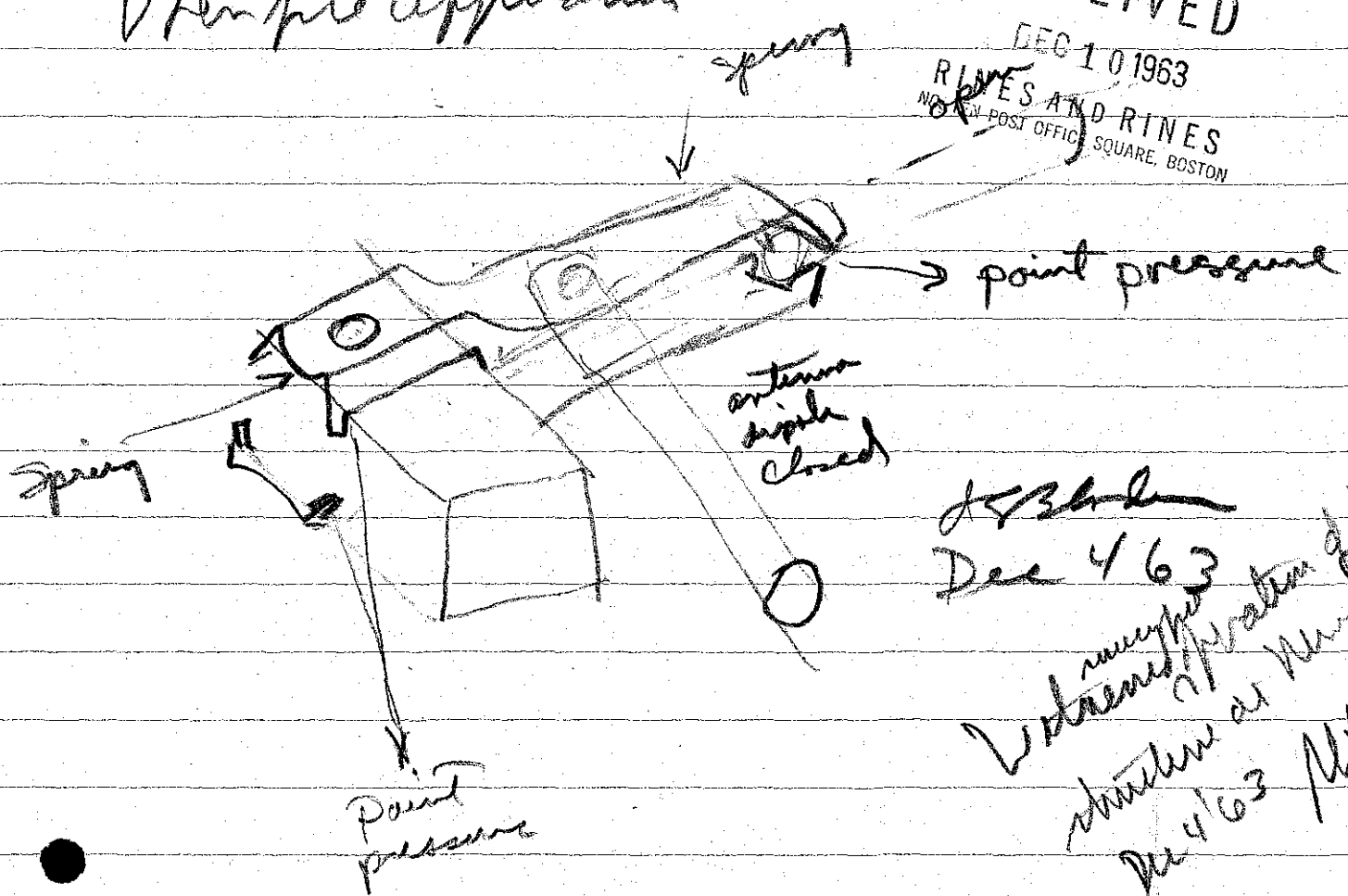
Dec 4 '63

(based on existing substation watermeter  
pressure - day meter & other connections of antenna  
elements)

Blender & Helmut Schneider

Saw 1st working model, further  
complete antenna elements to be built & tested  
Open file application

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JSS  
Dec 4 63  
Watermeter  
structure of the  
Dec 4 '63  
Rines

250

DIV. NO.

NOV. 21, 1963

FILING DATE

325 511

SERIAL NO. (Series of 1960)

*cards made out*

FILING RECEIPT

U. S. DEPT. OF  
COMMERCE  
PATENT OFFICE

BLONDER, ISAAC S. OF WEST ORANGE, N. J.  
SCHENFELD, ABRAHAM OF NEW YORK, N. Y.

RECEIVED

APPLICANT

INVENTION

DIRECTIVE ANTENNA

DEC 9 1963

Receipt is acknowledged of the patent application identified at right. It will be considered in its order and you will be notified as to the examination thereof.

DRAWINGS

EXTRA CL'S

FILING FEE

1

\$30

RINES AND RINES  
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TRANSACTION

ATT'Y DK.

64955

RINES AND RINES  
TEN POST OFFICE SQUARE, ROOM 1318,  
BOSTON 9, MASS.

Commissioner  
(Over)

490

Mailed to  
P.O. 11/10/63

## DIRECTIVE ANTENNA

The present invention relates to directive antennas and, more specifically, to antennas adapted for receiving very high frequencies, such as the ultra-high-frequency television band.

Numerous types of antennas have been evolved for broad-band directive radio and television reception including driven arrays, Yagi-type arrays, log periodic linear and V-type antennas, helical antennas and other configurations. The problems of mounting such antennas upon masts for outdoor operation or upon portable structures adapted for directional adjustment in connection with indoor reception have, however, long plagued the art; the mounting and adjusting structures introducing "ghosts" and other deleterious electrical field-pattern aberrations over the band. It is to the improvement of such mounting structures and the minimizing of electrical interfering effects over a wide band of frequencies, including stabilizing of outdoor performance and providing for ready adjustability in indoor performance, that the present invention is primarily directed.

A further object of the invention is to provide a new and improved antenna particularly adapted for ultra-high-frequency television reception.

Still another object is to provide a novel antenna of improved performance for more general use, also.

Other objects will be made more evident hereinafter and will be particularly pointed out in the appended claims. In summary, however, the invention contemplates

relative orientations without being confined to actual direction. Similarly, though the invention is described in connection with radio-wave reception, the antenna may also be used for transmission, if desired, as is well known.

Unlike prior-art arrays, including Yagi arrays, conventional log-periodic structures and the like, first and second pluralities of horizontal dipole elements 5, 7, 9...11 and 5', 7', 9'...11' are provided, lying in corresponding first and second vertically spaced horizontal planes I and I' containing the respective <sup>conductors</sup> 1 and 1'. The dipole elements are shown <sup>extending</sup> ~~extending~~ <sup>from opposite</sup> sides of each conductor at successive points therealong. The dipole elements connected to one conductor, moreover, extend in opposite horizontal directions to the corresponding dipole elements of the other conductor (such as 5 to the right, 5' to the left; 7 to the right, 7' to the left; and so on). The length of the dipole elements preferably successively increases from one end (5, 5' being shortest) towards the other end (11, 11' being longest), as is well known, to provide directivity. A parallel-wire transmission line TL is connected at looped terminal portions 1'' and 1''' <sup>at the corners of the clamps 1'' and 1''' in spaced-apart relation</sup> beyond the clamp 2, extending outside or to the left of the smallest dipole elements 5, 5'. The line TL may be supported below the antenna by depending guides 2' and 4' in the respective clamps 2 and 4, the latter being shown positioned near the largest dipole elements 11, 11'.

The antenna of Fig. 1 is mounted upon a mast M through the use of pairs of horizontally spaced conductor-loop extensions 10 and 10', shown extending to the right beyond the longest dipole elements 11, 11'. The extensions 10, 10', respectively, terminate in upwardly and downwardly extending vertical loops 12 and 12' that may be transversely



curved to fit the mast M, as shown, and are securely mechanically strapped at 14 and 14' to the mast to hold the system 1-1' in rigid spaced-apart relation at the mast end. Further to aid in mechanical stability, the extension 10', while in part initially extending in the lower horizontal plane I', diverges downwardly at 10''. Fortuitously, this mechanical stability-providing diverging construction has been found minimally to affect the electrical field pattern, particularly if the length of the extension between the longest elements 11, 11' and the mast M is made comparable to the separation along conductors 1 and 1' of the last dipole elements 11 from the next-to-the last element, to its left in Fig. 1. Minimal field aberrations and "ghost" reflections over the complete ultra-high-frequency band, for example, has been thus attained with the above construction, together with satisfactory broad-band impedance matching, provided further that the vertical separation distance of the rigid conductors 1, 1' is kept less than the average distance between successive dipole elements (preferably the order of an inch for UHF band operation), and which, in turn, is kept much less than the wavelengths involved, as is well known. At the UHF channel 47 frequency, for example, (671 megacycles) a 20 decibel front-to-back ratio has been obtained with this construction, providing about a 36-degree half-power horizontal beam width and no detectable forward secondary lobes.

This same general type of construction has also been found admirably suited for indoor direction adjustable antennas, as shown in Fig. 2. In this embodiment, however, the small-dipole end of the antenna is used not only for the

connection to the transmission line, but also for the support-providing extensions. These extensions are illustrated as rigid conductors 20 and 20' depending at preferably an acute angle below the antenna at the insulating clamp 2 and slightly diverging for mechanical and impedance-matching purposes, being clamped at their bottom or free ends by a further insulating clamp 6. The transmission line TL is thus connected to the conductors 1 and 1' by these combined extension-supporting and transmission-line feed members 20, 20'. The clamp 6 is pivoted at 6' to a bracket carried by a base 22 so that the members 1-1'-20-20' may be adjusted as a unit for maximizing reception. For both electrical impedance-matching purposes and appropriate pivoting action for reception-direction adjustment, the length of the preferably diverging extension lines 20, 20' is made substantially equal to the length of the rigid antenna-supporting conductors 1, 1'.

If VHF reception is also to be provided, it has been found that minimal interference is caused by the antenna of the present invention if V-type VHF dipoles 30 are mounted on the base forward of the pivoted clamp 6 and with a sufficient included angle in the V to contain the array of the invention.

Further modifications will occur to those skilled in the art and all such are considered to fall within the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. An antenna for ultra-high-frequency operation and the like, having, in combination, a pair of rigid conductors held spaced a predetermined vertical distance apart in a vertical plane, first and second pluralities of horizontal dipole elements lying in corresponding first and second vertically spaced horizontal planes containing the respective conductors, the dipole elements extending from opposite sides of each conductor at successive points therealong with dipole elements connected to one conductor extending in opposite horizontal directions to the corresponding dipole elements of the other conductor, the length of the dipole elements successively increasing from one end of the conductors towards the other end thereof, means for connecting a parallel-wire transmission line to the said one end of the conductors and means for mounting the antenna comprising a further pair of rigid diverging conductive extensions of the said conductors mechanically secured in rigid spaced-apart relation at an end thereof.

2. An antenna as claimed in claim 1 and in which the said vertical distance is less than the distances between the said successive points.

3. An antenna as claimed in claim 1 and in which the said diverging conductive extensions are provided at the said other end of the pair of rigid conductors and the mechanical securing means comprises mast-strapping means.

4. An antenna as claimed in claim 3 and in which the said extensions each comprise a pair of horizontally spaced conductors terminally provided with a vertical loop for strapping against the mast.



5. An antenna as claimed in claim 4 and in which one of the said extensions extends to the mast in the said horizontal plane of its rigid conductor and the other extension in part extends toward the mast in the said horizontal plane of its rigid conductor but then diverges therefrom.

6. ~~An antenna as claimed in claim 4 and in which~~  
the distance of the said mast-strapping loops from the said other end <sup>is</sup> comparable to the distance between the longest and next-to-longest pairs of dipole elements of the antenna.

7. An antenna as claimed in claim 1 and in which the spacing means holding the rigid conductors comprises a pair of insulating clamps, one of which is disposed at the said one end extending outside the region of the shortest dipole elements and the other of which is disposed near the longest dipole elements near the other end of the said pair of rigid conductors.

8. ~~An antenna as claimed in claim 1 and in which~~  
the transmission-line connecting means and the diverging conductive extensions <sup>are</sup> combined and extend downward from the said one end to include an acute angle between the dipole carrying conductors and their extensions.

9. An antenna as claimed in claim 8 and in which the conductive extensions are clamped at their free ends against relative movement with the clamp being pivotally mounted upon a base to permit adjustment, as a unit, of the dipole-carrying conductors and their extensions.

10. An antenna as claimed in claim 9 and in which a pair of V-type dipole elements for different frequency reception, are mounted on the said base forward of the pivotal clamp, with the said horizontal dipole elements contained within the V.



*Post letters*

ISAAC S. BLONDER

ABRAHAM SCHENFELD

the United States of America

West Orange, New Jersey

the United States of America

New York, New York

DIRECTIVE ANTENNA

*Gen Post office, Room 1318*

*25th October*

63

*of Isaac S. Blonder*

5 Crestview

West Orange, New Jersey

*of Abraham E. Schenfeld*

564 Audubon Avenue

New York, New York

New Jersey

Essex

ISAAC S. BLONDER

ABRAHAM SCHENFELD

*Seal*

*of Donald M. Shocket*

My commission expires:

*Aug 27, 1967*

## A S S I G N M E N T

Know all Men by these Presents:

That Whereas We, Isaac S. Blonder, of 5 Crestview Avenue, West Orange, County of Essex and State of New Jersey and Abraham Schenfield, of 564 Audubon Avenue, New York, County of New York and State of New York, have invented certain improvements in

### DIRECTIVE ANTENNA

and have described and claimed the same in an application for Letters Patent of the United States therefor, said application having been executed by us of even date herewith; and

WHEREAS, Blonder-Tongue Electronics, a corporation duly organized and existing under and by virtue of the laws of the State of New Jersey and having a principal place of business at Newark, in the said State of New Jersey, hereinafter called the Company, is desirous of acquiring the entire and exclusive right, title and interest in, to and under the said invention, the said application for Letters Patent of the United States and of all other countries that may be granted for the said invention;

Now, Therefore, for and in consideration of the sum of One Dollar (\$1.00) and other good and valuable considerations to us paid by the Company, the receipt of which in full is hereby acknowledged, We, the said Isaac S. Blonder and Abraham Schenfield, have sold, assigned, transferred and set over and by these presents do hereby sell, assign, transfer and set over unto the Company, its successors and assigns, the entire and exclusive right, title and interest in, to and under the said invention, the said application for Letters Patent of the United States, and any and all Letters Patent of the United States and all other countries that may be granted for the said invention, and all other patent rights that may be based thereon, including all renewals, divisions, reissues, continuations, and extensions thereof;

To Have, Hold and Enjoy the same to the Company, its successors and assigns, to its and their own use and behoof, to the full end of the term or terms for which the said Letters Patent or other patent rights may be granted, as fully and entirely as the same might have been held and enjoyed by us if no sale or assignment thereof had been made.

And We hereby authorize and request the Commissioner of Patents or other proper governmental authority to issue all Letters Patent or other patent rights for the said invention resulting therefrom to the Company, its successors and assigns, in accordance with this assignment, as assignee of the entire right, title and interest therein and thereto, and covenant that we have full right so to do.



And for the considerations aforesaid, We agree that We will communicate to the Company, or its representatives, any facts known to us respecting the said invention, whenever requested, and will testify in any legal proceeding, sign all lawful papers, make all rightful oaths, and generally do everything possible to aid the Company, its successors, assigns and nominees, to obtain and enforce proper patent protection for the said invention in all countries, or to perfect or defend its or their title in the premises.

Witness our hands and seals at Newark, New Jersey  
this 25th day of October 1963.

*Isaac S. Blonder*  
\_\_\_\_\_  
Isaac S. Blonder

*Abraham Schenfeld*  
\_\_\_\_\_  
Abraham Schenfeld

#### ACKNOWLEDGMENT

State of New Jersey:  
County of Essex : ss.

On this 25th day of October 1963, before me personally appeared Isaac S. Blonder and Abraham Schenfeld, to me known to be the persons described in and who executed the foregoing instrument, and each acknowledged that he executed the same as his free act and deed.

Notarial Seal

*Donald M. Sallachoff*  
\_\_\_\_\_  
Notary Public  
My commission expires:

8/27/67



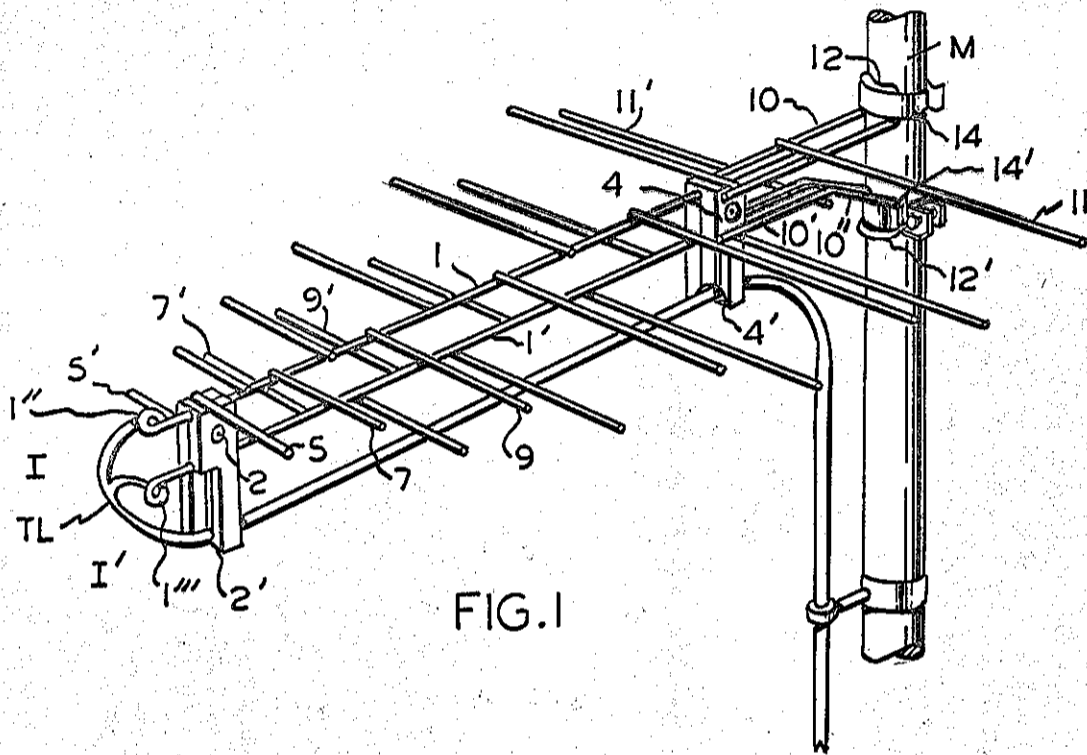


FIG. 1

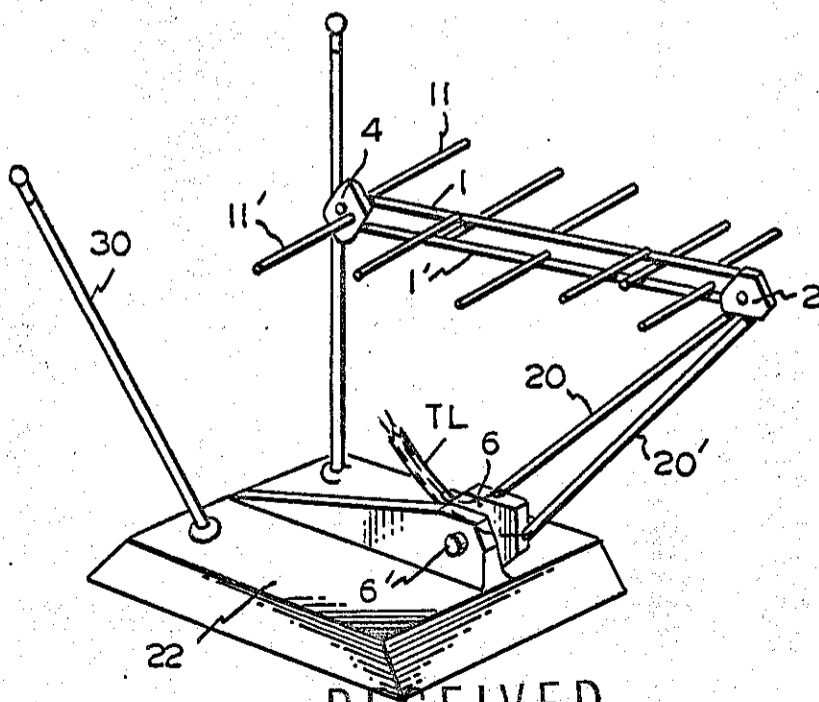


FIG. 2

INVENTORS

ISAAC S. BLONDER  
ABRAHAM SCHENFELD

BY

*Rines and Rines*

ATTORNEYS

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NOV 19 1963

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NO. TEN POST OFFICE SQUARE, BOSTON

- 1) page 3 line 4 from bottom  
extensions 10 and 10' were in 10 on FIG. 1. ?
- 2) page 4 line 6 from top 10' were in it on FIG 1 ?
- 3) page 4 line 6 from bottom 36° ? (about 50°).

My full name.

ABRAHAM E. SCHENFELD.

AS

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OCT 28 1963

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NO. TEN POST OFFICE SQUARE, BOSTON.

October 18, 1963

Mr. Isaac S. Blonder  
Blonder-Tongue Electronics  
9 Alling Street  
Newark 2, New Jersey

Re: "Directive Antenna" Application

Dear Ike:

We enclose the specification, claims and drawing in connection with the above-entitled application. We request, if all is in order, that you sign the oath-petition (the last page) and have Mr. Schenfeld sign the oath-petition before a notary. We request also that both of you sign the enclosed assignment and that you return all of the enclosed documents to us for filing.

Very truly yours,

RINES AND RINES

By \_\_\_\_\_

RS/ED  
Encs.

PENAL

11/11/63  
5:00



005163  
RMR

JOHN W. WALKER  
ISAAC B. KLONDER  
and  
ABRAHAM SCHENFELD

# Directive Antenna

U.S. Patent  
564 Audubon Ave  
NYC

The present invention relates to directive antennas and, more specifically, to antennas adapted for receiving very high frequencies, such as the ultra-high-frequency television band.

Numerous types of antennas have been evolved for <sup>broad-band</sup> directive <sup>radio and television</sup> ~~ultra-high-frequency~~ reception including log periodic linear and V-type antennas,

Yagi-type arrays, helical antennas and ~~other~~ other configurations. The problems of mounting such antennas upon masts for outdoor operation or upon portable structures adapted for directional adjustment in connection with indoor reception have, however, long plagued the art; the mounting <sup>structures</sup> introducing "ghosts" and other deleterious electrical field-pattern aberrations over the band. It is to

the improvement of such mounting structures and the minimizing of electrical interfering effects over a wide band of frequencies, including stabilizing of performance ~~and~~ and providing for ready <sup>adjustability</sup> <sup>outdoor</sup> adjustability in indoor performance, that the present invention is primarily directed.

A further object of the invention is to provide a new and improved antenna particularly adapted for ultra-high-frequency television reception.

Still another object is to provide a novel antenna of improved performance for more general use, also.

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OCT 7 1963

U.S. PATENT AND TRADEMARK OFFICE, BOSTON

RECEIVED

OCT 7 1933

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NO. TEN POST OFFICE SQUARE, BOSTON

Other objects will be made more evident hereinafter & will be particularly pointed out in the appended claims. In summary, however, the invention contemplates a pair of rigid conductors held spaced a predetermined vertical distance apart in a vertical plane, first & second pluralities of horizontal dipole elements lying in <sup>conjugate</sup> first & second vertically spaced horizontal planes containing the respective conductors, the dipole elements extending from opposite sides of each conductor at successive points therealong with dipole elements connected to one conductor extending in opposite horizontal directions to the corresponding dipole elements of the other conductor, the length of the dipole elements necessarily increasing from one end of the conductors towards the other end thereof, <sup>means for feeding the antenna</sup> and means for mounting the antenna.

energy received by the antenna at <sup>the</sup> ~~the~~ radial end of the conductors,

→ comprising a further pair of rigid, preferably diverging, conductive extensions of the said conductors mechanically secured in rigid spaced-apart relation at the end thereof. Further preferred details are hereinafter set forth.

The invention will now be described in connection with the accompanying drawing, Fig. 1 of which is an isometric view of an outdoor preferred embodiment thereof; and

Fig. 2 is a similar view of a modified in-door version.

Referring to Fig. 1, the antenna comprises a pair of rigid conductors 1, 1' held spaced apart a predetermined vertical distance in a vertical plane by <sup>and rearward</sup> forward insulating clamps 2 and 4. <sup>Why</sup> These terms "vertical" and "horizontal" as herein employed describe the preferred orientation for ultra-high-frequency television reception, <sup>they</sup> ~~are~~ intended <sup>to</sup> ~~be~~ illustrative of relative orientations, ~~as they are not~~ <sup>that</sup> without being confined to actual direction. Similarly, though the invention is described in connection with radio-wave reception, the antenna may also be used for transmission, <sup>if desired,</sup> as is well known.

more generally to ~~the~~ <sup>relatively</sup> ~~illustrative~~ of relative orientations, ~~as they are not~~ <sup>that</sup> without being confined to actual direction. Similarly, though the invention is described in connection with radio-wave reception, the antenna may also be used for transmission, <sup>if desired,</sup> as is well known.

Unlike ~~the~~ <sup>power</sup> ~~inward~~ <sup>air</sup> ~~including~~ <sup>apart</sup> ~~the~~ <sup>insulating</sup> ~~clamps~~ <sup>and</sup> ~~the~~ <sup>rigid</sup> ~~conductors~~ <sup>1, 1'</sup>

(as per 5 & 9) ~~the~~ <sup>are shown</sup> ~~elements~~ <sup>extending</sup> ~~from~~ <sup>opposite</sup> ~~sides~~ <sup>of</sup> ~~each~~ <sup>conductor</sup> ~~at~~ <sup>successive</sup> ~~points~~ <sup>therealong</sup> ~~and~~ <sup>the</sup> ~~with~~ <sup>the</sup> ~~the~~ <sup>dipole</sup> ~~elements~~ <sup>are</sup> ~~connected~~ <sup>to</sup> ~~one~~ <sup>conductor</sup> ~~(5, 7, 9... H, for example)~~ ~~and~~ <sup>extend</sup> ~~in~~ <sup>opposite</sup> ~~horizontal~~ <sup>directions</sup> ~~to~~ <sup>the</sup> ~~conducing~~ <sup>dipole</sup> ~~elements~~

First & second pluralities of horizontal dipole elements 5, 7, 9... H and 5', 7', 9'... H' <sup>are provided,</sup> lying in correspondingly first & second vertically spaced horizontal planes I and I' containing the respective conductors 1 and 1'. The dipole elements <sup>are shown</sup> extending from opposite sides of each conductor at successive points therealong, <sup>and</sup> ~~with~~ <sup>the</sup> dipole elements, <sup>are</sup> ~~connected~~ <sup>to</sup> ~~one~~ <sup>conductor</sup> ~~(5, 7, 9... H, for example)~~ ~~and~~ <sup>extend</sup> ~~in~~ <sup>opposite</sup> ~~horizontal~~ <sup>directions</sup> ~~to~~ <sup>the</sup> ~~conducing~~ <sup>dipole</sup> ~~elements~~

Moreover,

(4)

of the other conductor (such as 5' to the right, 5' to the left; 7' to the right, 7' to the left; and so on). The length of the dipole elements <sup>separately</sup> increases from one end (5, 5' being shorter) towards the other end (11, 11' being longer), as is well known, to provide directivity. ~~The~~ <sup>A</sup> parallel-wire transmission line is connected at looped terminal portions 1" and 1" beyond the clamp 2, ~~extending~~ extending out to the left of the smaller dipole elements 5, 5'. The line TL may be supported below the antenna by depending guides 2' and 4' in the respective clamps 2 and 4, the latter being <sup>shown</sup> positioned near the largest dipole elements 11, 11'.

The antenna of Fig 1 is mounted upon a mast M through the use of pairs of horizontally spaced conductor-loop extensions 10 and 10' <sup>shown</sup> extending to the right beyond the largest dipole elements 11, 11'. ~~The extensions 10, 10'~~ <sup>the extensions 10, 10'</sup> respectively terminate in upwardly and downwardly extending vertical loops 12 and 12' that may be curved to fit the mast M, as shown, and <sup>are secured mechanically</sup> strapped at 14 and 14' to the mast to hold the system 1-1' in rigid spaced-apart relation at the mast end.

mechanically

Further to aid in <sup>mechanical</sup> ~~stability~~ <sup>stability</sup> the extension 10', while <sup>in part</sup> initially extending in the lower horizontal plane I', diverges downwardly at 10". Fortunately, this mechanical stability <sup>has been</sup> found to provide excellent <sup>minimally</sup> to affect the <sup>electrical</sup> field pattern, particularly if the length of the

during construction

At the UHF channel 47 frequency,  
for example, (671 m.p.s.) a 20 degree  
front-to-back ratio has been  
obtained with <sup>the construction, however</sup> about a 16-dipole half-power  
horizontal beam.

under and  
separable  
no forward  
Secondary  
lobes.

extension between the larger elements 11, 11' and  
the main <sup>rod</sup> M is comparable to the ~~distance~~ separation  
along conductors 1 and 1' of the last dipole element 11  
~~# of elements~~ from the rear to the last  
element, but its left in Fig. 1. Minimal field  
aberrations and "ghost" ~~wave~~ reflections over the  
complete ultra high frequency band, for  
example, has been thus attained together with  
~~nearly~~ <sup>broad-band</sup> satisfactory impedance matching,  
provided <sup>further than</sup> the vertical separation distance  
of the <sup>right</sup> conductors 1, 1' ~~is~~ <sup>is kept</sup> less than the  
~~the~~ average distance between successive  
dipole elements <sup>(preferably the order of an inch for UHF band operation)</sup>, in turn, is kept <sup>much</sup>  
less than the wavelengths <sup>as is well known.</sup> involved.

With the above construction,

This same <sup>general</sup> type of construction has also  
been found admirably suited for <sup>direction</sup> adjustable  
antennas, as shown in Fig. 2. In this embodiment,  
however, the ~~last~~ small-dipole end of the antenna  
is used not only for the connection to the transmission  
line, but also for the supports - providing extensions.  
These extensions are illustrated as rigid conductors 20 and  
20' depending at preferably an acute angle  
below the antenna at the insulating clamp 2 and  
slightly diverging for mechanical and impedance -



6

matching purposes, being clamped at their bottom  
or free ends by a further insulating clamp 6.  
The transmission line TL is thus connected to  
the conductors 1 and 1' by these combined ~~and~~  
extension-supporting and ~~the~~ transmission-line  
feed members 20, 20'. For both electrical  
impedance - matching purposes and appropriate  
pivoting action for <sup>reception</sup> direction adjustment, the length  
<sup>of the extension</sup> of the ~~extension~~ lines 20, 20' is made ~~or~~ <sup>substantially</sup>  
equal to the length of the rigid antenna-supporting  
conductors 1, 1'.

The clamp 6 is pivoted at 6' to a bracket carried  
by a base 22 so that the <sup>members</sup> ~~unit~~ 1-1'-20-20' may  
be adjusted as a unit for ~~the~~ maximizing  
reception.

⊙ If VHF reception is also to be provided,  
it has been found that minimal interference  
is caused by the antennas of the present invention  
if V-type <sup>VHF</sup> dipoles 30 ~~are~~ <sup>are</sup> mounted <sup>on the base</sup> forward  
of the pivoted clamp 6 and <sup>with a</sup> ~~with a~~ <sup>included</sup>  
angle ~~to~~ in the V to contain the array of the  
invention.

Further modifications will occur to those  
skilled in the art & all such are considered to  
fall within the spirit & scope of the invention  
as defined in the appended claims.

What is claimed is:

1. An antenna for ultra-high-frequency operation and the like, comprising, in combination, a pair of <sup>rigid conductors</sup> ~~open wire transmission line sections~~ ~~mounted~~

held spaced a predetermined vertical distance apart in a vertical plane, <sup>first & second</sup> ~~pluralities of~~ <sup>horizontal</sup> dipole elements of successively decreasing length

connected to each conductor ~~at~~ <sup>lying</sup> ~~extending~~ <sup>connecting first and second vertical spaced</sup> ~~in~~ <sup>horizontal</sup> planes containing ~~one of~~ <sup>reflexing</sup> the conductors, ~~on opposite~~

<sup>elements extending from opposite</sup> ~~the dipole~~ <sup>each</sup> ~~sides of the~~ <sup>at</sup> conductor ~~from~~ successive points therealong with ~~the~~ dipoles ~~of~~ elements connected to ~~each~~ <sup>one</sup> conductor ~~horizontally~~ <sup>extending in opposite horizontal directions</sup> ~~disposed~~ between the

connecting dipole elements of the other conductor, the length of the dipole elements ~~to~~ successively increasing from one end of the conductors towards the other end

thereof, means for connecting a parallel-wire transmission line to the said one end of the conductors, and means for mounting the antenna comprising a further pair of <sup>rigid diverging</sup> conductive extensions of the said conductors mechanically secured in <sup>rigid</sup> spaced-apart relation at the end thereof.

2. An antenna as claimed in claim 1 in which the said vertical distance is less than the distance between the said successive points.

3. An antenna as claimed in claim 1 and in which the said diverging conductive extensions are provided at the said other end of the pair of rigid conductors and the ~~said~~ mechanical securing means comprises

fast-<sup>strapping</sup> ~~clamping~~ means.

4. An antenna as claimed in claim 3 and in which the said extensions <sup>each</sup> comprise a pair of horizontally spaced conductors terminally <sup>^</sup> provided with a vertical loop for strapping against the ~~said~~ mast.

5. An antenna as claimed in claim 4 and in which the said extensions extends to the mast in the plane of its rigid conductor and the other extension <sup>in part</sup> extends toward the mast in the said horizontal plane of its rigid conductor but then diverges therefrom.

6. An antenna as claimed in claim ~~3~~ <sup>4</sup> and in which the distance of the ~~mast~~ <sup>mast</sup> said strapping loops from the said other end is comparable to the distance between the ~~base~~ longest and next longest pairs of dipole ~~of~~ elements of the antenna.

7. An antenna as claimed in claim 1 and in which the <sup>spacing</sup> ~~spacing~~ means holding the rigid conductors comprises a pair of manipulating clamps one of which is disposed at the said one end <sup>extending</sup> outside the region of the ~~shortest~~ <sup>shortest</sup> dipole elements and the other <sup>of which</sup> is disposed near the longest dipole elements near the other end of the said <sup>pair of rigid</sup> conductors.

8. An antenna as claimed in claim 1 and in which the ~~transmission~~-line connecting means ~~and~~ the ~~two~~ diverging conductive extensions are combined and extend <sup>downward</sup> from the said one end to include an acute angle between the dipole carrying conductors and their extensions.

9. An antenna as claimed in claim 8 and in which the conductive extensions are clamped at their free ends against ~~relative~~ relative movement with the ~~said~~ clamp being pivotally mounted upon a base to permit adjustment, as a unit, of the dipole-carrying conductors and ~~the~~ their extensions.

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OCT 7 1953

10. ~~An antenna as claimed in claim 8~~ and in which a pair of V-type <sup>different frequency</sup> dipole elements are mounted on the said base forward of the pivotal clamp, for ~~variable~~ <sup>different</sup> frequency reception, with the said ~~horizontal~~ dipole elements contained within the V.

11. (Copy 1 with fullay changes:)

11. An antenna as claimed in claim 2 and in which <sup>all of</sup> the said ~~several~~ <sup>many</sup> diameters are less than the wavelength of the ultra-high-frequency

12. ~~described~~ change "ultra-high-frequency" operation of the like "d.c." operation <sup>over</sup> a predetermined frequency band.

line 3 from end, over "diverging".

13. An antenna as claimed in claim 12 and in which the said vertical distance is less than the distances between the said successive points and much less than the wavelength of the said band.

14. An antenna as claimed in claim 8 and in which the lengths of the said conductors and of their extensions are substantially equal.

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*Apple*

*Morley Schampel*

*Pop*

*Walter Chung*

*Paul Harris*

Send the above Radiogram subject to the conditions, regulations and rates as set forth in the applicable tariff of RCA Communications, Inc., and on file with the regulatory authorities.

RCA COMMUNICATIONS, INC., A SERVICE OF RADIO CORPORATION OF AMERICA

(OVER)

October 8, 1963

Baran Associates  
637 Warner Building  
Washington 4, D. C.

Re: Directive Antenna

Dear Sirs:

Please prepare a patent drawing comprising Figs. 1 and 2 shown in the enclosed material. Note that Fig. 2 is the figure of the photograph and not the Fig. 2 shown in the lower right-hand corner of the enclosed Blonder-Tongue bulletin.

Very truly yours,

RINES AND RINES

By \_\_\_\_\_

RS/ED

Enc.

*Isaac S. Blonder*  
Mr. Isaac S. Blonder  
Mr. Abraham Schenfeld





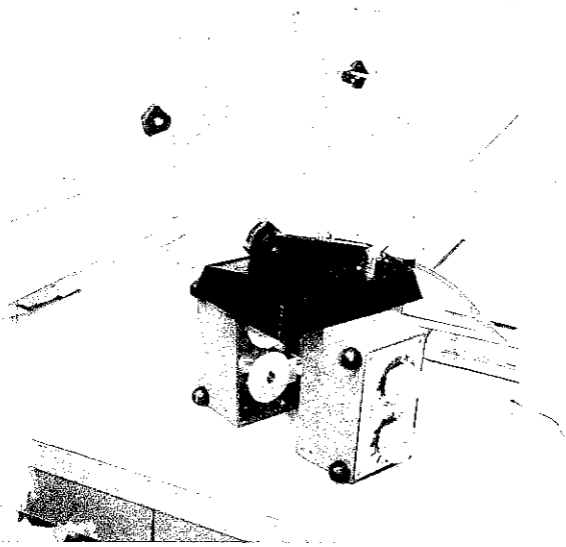
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ALPHACON CORPORATION  
1000 W. 10TH AVENUE  
DENVER, COLORADO 80202

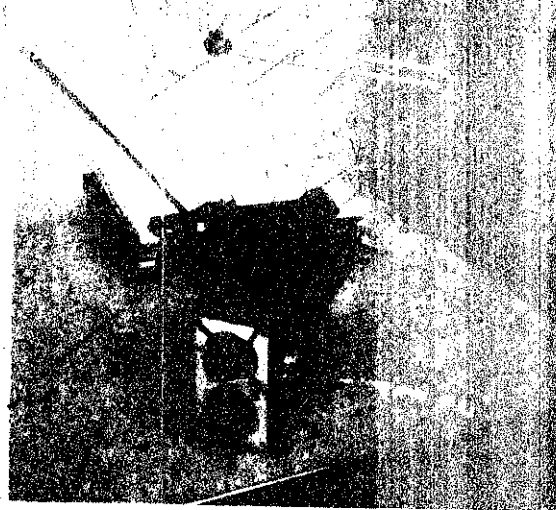


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OCT 7 1963

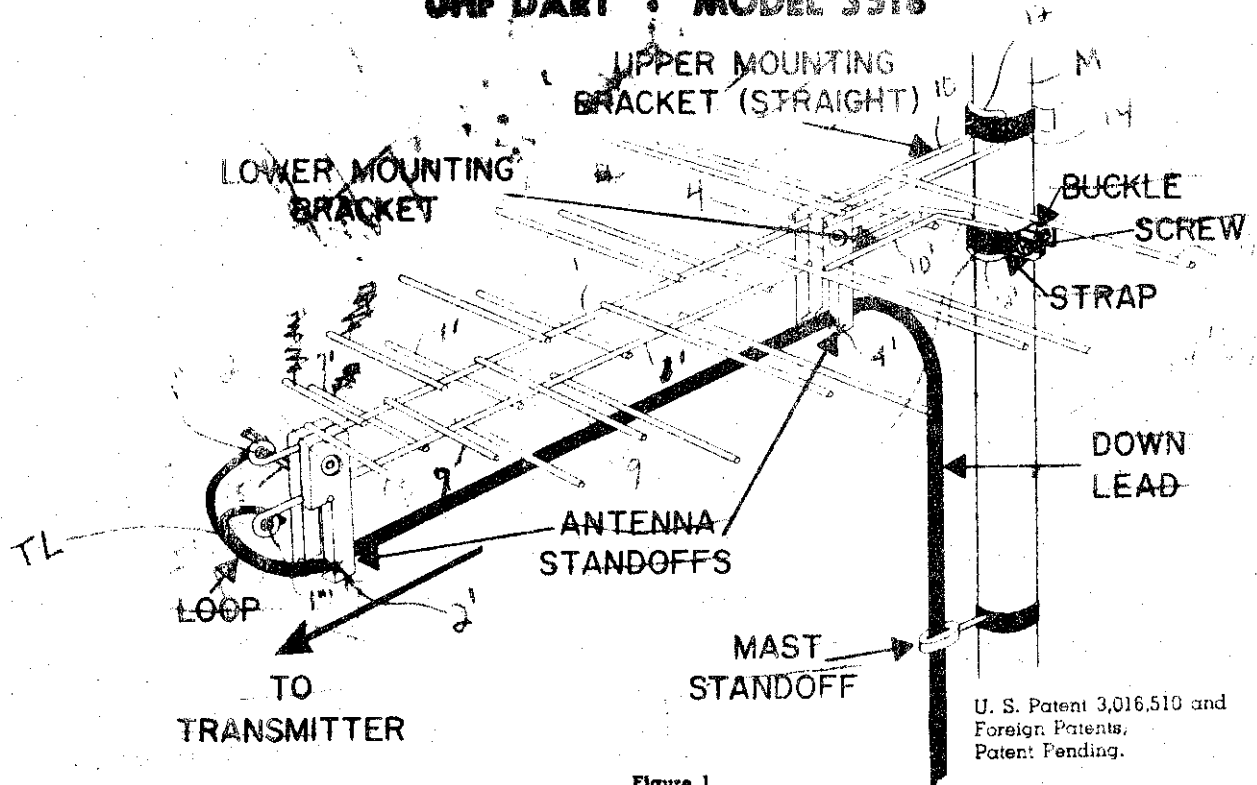
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NO. TEN POST OFFICE SQUARE, BOSTON



# BLONDER TONGUE OUTDOOR ANTENNA

UHF DART • MODEL 3513



U. S. Patent 3,016,510 and Foreign Patents, Patent Pending.

Figure 1

THE DART IS A QUALITY ANTENNA THAT EMPLOYS THE LATEST DEVELOPMENTS IN THE ANTENNA FIELD

*Among Its Features*

- All joints welded for long life
- Front-to-back ratio over 20 db
- Completely pre-assembled
- Excellent for color TV
- Works with all-channel sets, UHF boosters and UHF converters
- Good match and gain over the full UHF band

**INSTALLATION INSTRUCTIONS**

1. Remove the antenna from the carton.
2. Remove the plastic bag. It contains: (2) stainless steel mounting straps.
3. Place antenna on the pole (as shown in Figure 1). Make sure that the straight mounting bracket is on top. Pull the mounting strap around this mounting bracket and the mast. Then, thread the mounting strap through the buckle (from inside out) and tighten the screw until the unit is secured.
4. Now secure the lower mounting bracket in the same manner. (Bend the loose ends of the straps, around and behind the antenna).
5. Down lead 300Ω connection.
  - A. It is recommended you use low loss foam twinlead. If you use flat twinlead, cut slit  $1\frac{1}{4}$ " to  $1\frac{1}{2}$ " as shown in fig. 2. Slip each side of the twinlead under the sawtooth washers and then tighten the screws so that these washers pierce the twinlead, making contact with the wires inside. Be careful not to strip the threads of the terminal screws by turning them too hard. To attach UHF tubular or encapsulated twinlead, reduce the thickness of the cable by trimming off with a knife about  $1/16$ " from each wide surface.
  - B. If a low loss coaxial downlead is desired, a balun such as Blonder-Tongue CMB-92U can be used. RG11/U foam cable is recommended.
  - C. Form a loop as shown in Figure 1. Slip cable into antenna stand offs. allow no slack in cable. Dress cable as shown, and use additional UHF standoffs alongside the mast. Make sure that the cable will not touch any metal parts of the antenna or the mast.
6. After connecting your antenna properly, orient your antenna towards the transmitter as shown in figure 1 for picture reception.

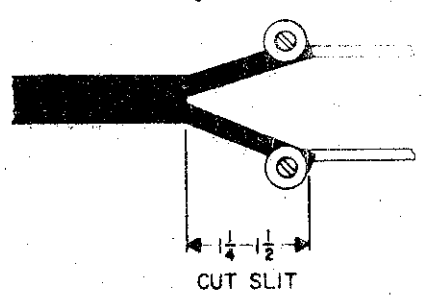


Figure 2





FIG. 2

# BLONDER TONGUE OUTDOOR ANTENNA

THE DART MODEL 3518

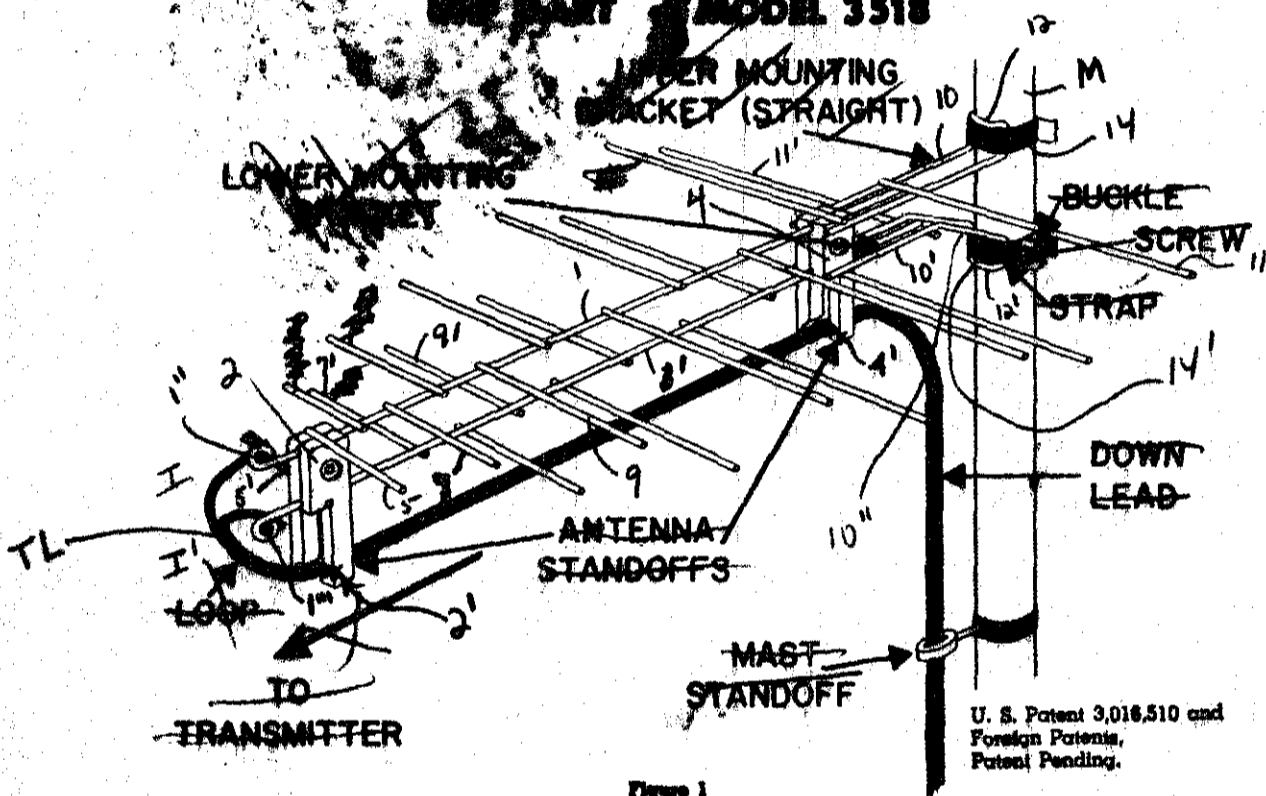


Figure 1

THE DART IS A QUALITY ANTENNA THAT EMPLOYS THE LATEST DEVELOPMENTS IN THE ANTENNA FIELD

### Among Its Features

- All joints welded for long life
- Front-to-back ratio over 20 db
- Completely pre-assembled
- Excellent for color TV
- Works with all-channel sets, UHF boosters and UHF converters
- Good match and gain over the full UHF band

### INSTALLATION INSTRUCTIONS

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2. Remove the plastic bag. It contains: (2) stainless steel mounting straps.
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4. Now secure the lower mounting bracket in the same manner. (Bend the loose ends of the straps, around and behind the antenna).
5. Down lead 300Ω connection.
  - a. It is recommended you use low loss foam twinlead. If you use flat twinlead, cut slit 1/4" to 1/2" as shown in fig. 2. Slip each side of the twinlead under the sawtooth washers and then tighten the screws so that these washers pierce the twinlead, making contact with the wires inside. Be careful not to strip the threads of the terminal screws by turning them too hard. To attach UHF tubular or encapsulated twinlead, reduce the thickness of the cable by trimming off with a knife about 1/16" from each wide surface.
  - b. If a low loss coaxial downlead is desired, a balun such as Blonder-Tongue CMB-22U can be used. RG11/U foam cable is recommended.
  - c. Form a loop as shown in Figure 1. Slip cable into antenna stand offs, allow no slack in cable. Drive cable as shown, and secure with a screw. Run cable down the mast. Make sure that the cable will not touch any part of the

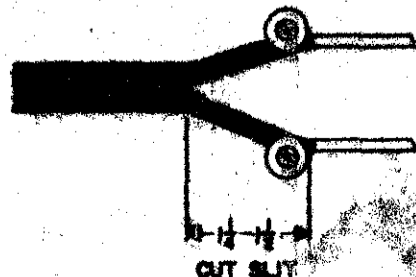


Figure 2

FIG. 1

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OCT 7 1963

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Letter Office  
Draftman

U P O

Andhra

265511

etc -

The Office Draftman is requested to correct the drawing as indicated and send with accompanying copy, charging the cost to the account of the undersigned attorney.

V. S. S. S.

1/2/2

Note:

Be sure to state the no. in the drawing to  
the drawing

(orig  
3 cups)

Journal

Paper No. 3

Amendment <sup>5</sup> ~~A~~ B

UNITED STATES PATENT OFFICE

ISAAC S. BLONDER *et al*

S.N. 325,511

Filed: November 21, 1963

Group 250

DIRECTIVE ANTENNA

Boston, Massachusetts

May 5, 1965

*April 1, 1966*

Hon. Commissioner of Patents

Washington 25, D. C.

Sir:

*Replying to the Examiner's communication of January 26, 1966,*  
please amend the above-numbered application

as follows:

Page 3, line 10, before "conductors" insert:

--longitudinal--.

Page 3, line 11, change "extending" to: --angularly

extending transversely--.

Page 3, line 22, before the comma insert: --that

secures the connecting portions 1'' and 1''' in spaced-apart  
relation--.

Claim 12, line 2, after "rigid" insert:

--longitudinal--.

Claim 12, lines 4 and 5 and in line 10, cancel

"horizontal".



Claim 6, cancel line 1 and substitute:--

like claim 1  
An antenna for ultra-high-frequency operation and the like, having, in combination, a pair of rigid conductors held spaced a predetermined vertical distance apart in a vertical plane, first and second pluralities of horizontal dipole elements lying in corresponding first and second vertically spaced horizontal planes containing the respective conductors, the dipole elements extending from opposite sides of each conductor at successive points therealong, with dipole elements connected to one conductor extending in opposite horizontal directions to the corresponding dipole elements of the other conductor, the length of the dipole elements successively increasing from one end of the conductors towards the other end thereof, means for connecting a parallel-wire transmission line to the said one end of the conductors and means for mounting the antenna comprising a further pair of rigid diverging conductive extensions of said conductors mechanically secured in rigid spaced-apart relation at one end thereof, the said diverging conductive extensions being provided at the said other end of the pair of rigid conductors and each comprising a pair of longitudinally spaced conductors terminally provided with a vertical loop, and the said mechanical securing means comprising a strap-securing means for strapping the said vertical loops, and --.

Claim 6, line 3 change "is" to "being".

Claim 8, cancel line 1 and substitute:--

Claim 8, line 3, change "are" to "being". Same line, change "extend" to "extending".

Claim 13, cancel line and substitute: -- An antenna for operation over a predetermined frequency band, having, in combination, a pair of rigid longitudinal conductors held spaced a predetermined vertical distance apart in a vertical plane, first and second pluralities of dipole elements lying in corresponding first and second vertically spaced horizontal planes containing the respective conductors, the dipole elements extending from opposite sides of and transversely at an angle to each conductor at successive points therealong with dipole elements connected to one conductor extending in opposite direction to the corresponding dipole elements of the other conductor, the length of the dipole elements successively increasing from one end of the conductors towards the other end thereof, means for connecting a parallel-wire transmission line to the and one end of the conductors,

~~the said one end of the conductors,~~

rigid insulating means securing the said connecting means mechanically in spaced-apart relation and connected with means for supporting the transmission line near the said one end, and means for mounting the antenna at a region of the said conductors remote from the said one end, further rigid insulating means being provided for securing the said longitudinal conductors mechanically in rigid spaced-apart relation near the said region,

Claim 13, line 2, change "is" to "being"

Please delete, without prejudice or disclaimer,  
claims 1 through 5, 7, 11, <sup>and</sup> 12.

Page 5, line 12, cancel "maximizing reception." For "

### REMARKS

While the applicants do not contend that the novel structures of the rejected claims are mere obvious expedients, none of the references even hinting at the same, let alone disclosing them, since the office has indicated certain claims to be allowable that the applicants consider adequately protect the commercial embodiments of their invention, it appears unnecessary to prolong the prosecution further, and the rejected claims are accordingly cancelled without prejudice or disclaimer.

The remaining claims having been allowed and being <sup>substantially</sup> rewritten from independent form, reconsideration & allowance appear to be in order and are reported.

Very respectfully,

James H. Jones

R,

Attorney for the Applicants

FILING DATE <b>11/21/63</b>	SERIAL NO. <b>325511</b>	PATENT NO. <i>Ent.</i> <b>3259904</b>	DATE OF PATENT <b>07/05/66</b>	
INVENTOR	<b>Blonder, Isaac S. ; West Orange, N. J., and          Schenfeld, Abraham; New York, N. ; Y.</b>			
ASSIGNEE	<b>Blonder-Tongue Electronics</b>			
INVENTION	<b>Antenna having combined support and lead-in</b>			
PO-162D ISSUE FEE RECEIPT	EST. DR'W & SPEC PAGES <b>000 2</b>	ISSUE FEE PAID <b>\$122</b>	DATE FEE PAID <b>05/19/66</b>	CLASS-SUB <b>343/792.5</b>
THE ISSUE FEE IN THIS APPLI- CATION HAS BEEN RECEIVED COMMISSIONER	<b>Rines and Rines          Ten Post Office Sq.          Boston 7, Mass.</b>			<b>RECEIVED</b>
U. S. DEPARTMENT OF COMMERCE		<b>RINES AND RINES</b> NO. TEN POST OFFICE SQUARE, BOSTON PATENT OFFICE <b>02920</b>		

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WASHINGTON, D. C. 20231

U. S. DEPARTMENT OF COMMERCE  
PATENT OFFICE  
WASHINGTON

All communications respecting  
this application should give the  
serial number, date of filing,  
and name of the applicant.

**NOTICE OF ALLOWANCE  
AND ISSUE FEE DUE**

*See Letters in  
D-T- Illinois  
Sunt*

*Final Fee  
Paid by M. Shapiro  
(Shapiro Bill of 5/24/66)*

*Pat. # 3257904  
to issue  
7/5/66.*

The application for patent identified below has been examined and found allowable for issuance of Letters Patent.

	FILING DATE <b>11/21/63</b>	SERIAL NO. <b>325,511</b>	NO. OF CLAIMS ALLOWED <b>6</b>	EXAMINER <b>H. K. Saulbach</b>	GROUP <b>25</b>
APPLICANT	<b>Blonder, Isaac S., West Orange, N. J., and Schenfeld, Abraham, New York, N. Y.</b>				<b>Mailed May 19, 1966</b>
TITLE OF INVENTION (X indicates as amended by examiner)	<b>Antenna having combined support and lead-in</b>				
<b>X</b>	NO. SHEETS @ \$2 EACH	SPEC NO. PAGES @ \$10 EACH	ISSUE FEE DUE	CLASS-SUB	
	<b>1</b>	<b>2</b>	<b>\$122.00</b>	<b>343/792.5</b>	

With the allowance of the application, the above indicated Issue Fee becomes due and payment must be made within three months of the date of this Notice or the Patent will become abandoned (forfeited).

The Issue Fee is one hundred dollars (\$100) plus two dollars (\$2) for each printed sheet of drawing and ten dollars (\$10) for each printed page of specification, or portion thereof.

Inasmuch as the number of printed pages of specification must be determined in advance of printing from the amount of matter in the allowed application, the Issue Fee is subject to change. After the patent has been printed, the estimate will be reviewed in light of the actual number of pages of specification. If it is found that an overcharge was made, you will be notified thereof with the issuance of the Patent and a refund will be forthcoming. If the number of pages is underestimated by two or more pages, you will receive a notice of Additional Issue Fee Due with the Patent and payment of this amount must be made within three months of the date of that Notice. Failure to remit any additional fee due within three months from the date of that Notice will result in lapse of the Patent.

As a convenience in remitting this fee, use of the enclosed Form POL-85a is suggested. The Issue Fee will not be received from anyone other than the applicant, his assignee or attorney, or a party in interest as shown by the records of the Patent Office. A form is enclosed relating to the address of the inventor(s) which requires your attention.

If it is desired to have the patent issued to an assignee or assignees, an assignment, together with the fee for recording the same, must be filed in this Office on or before the date of payment of the Issue Fee.

The patent will be issued and forwarded within approximately two months after receipt of the Issue Fee.  
By direction of the Commissioner.

Rines and Rines  
Ten Post Office Square,  
Room 1318  
Boston 9, Massachusetts

**RECEIVED**  
**MAY 25 1966**  
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 PATENT OFFICE  
 WASHINGTON, D.C. 20231

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 WASHINGTON, D.C. 20231

MAY 13 1966

Rines and Rines  
 Ten Post Office Square, Room 1318  
 Boston 9, Massachusetts

APPLICANT	Isaac S. Blonder, Et Al
SERIAL NO.	325,511
GROUP	250
ORDER NO.	
LETTER OF	April 4, 1966

Dear Sir:

In accordance with the instructions in the letter dated above the drawing in the application identified has been corrected and returned to the Examiner in charge of this application.

A photocopy of the drawing is furnished herewith so that you can verify the corrections that have been made. Additional photocopies may be obtained from the Patent Office at a cost of 30 cents per sheet.

Very truly yours,

*Daniel M. Mills*

Daniel M. Mills  
 Chief Draftsman

*Entd*

DEPOSIT ACCOUNT CHARGE	\$ 3.00
CASH FEE PAID	
NO CHARGE	

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Paper No. 5

Amendment B

UNITED STATES PATENT OFFICE

ISAAC S. BLONDER ET AL

Ser. No. 325,511

Filed: November 21, 1963

DIRECTIVE ANTENNA

Group 250

Boston, Massachusetts

April 1, 1966

Hon. Commissioner of Patents

Washington 25, D.C.

Sir:

Replying to the Examiner's communication of January 26, 1966, please amend the above-numbered application as follows:

Claim 6, cancel line 1 and substitute: --An antenna for ultra-high-frequency operation and the like, having, in combination, a pair of rigid conductors held spaced a predetermined vertical distance apart in a vertical plane, first and second pluralities of horizontal dipole elements lying in corresponding first and second vertically spaced horizontal planes containing the respective conductors, the dipole elements extending from opposite sides of each conductor at successive points therealong with dipole elements connected to one conductor extending in opposite horizontal directions to the corresponding dipole elements of the other conductor, the length of the dipole elements successively increasing from one end of the conductors towards the other end thereof, means for connecting a parallel-wire



transmission line to the said one end of the conductors and means for mounting the antenna comprising a further pair of rigid diverging conductive extensions of said conductors mechanically secured in rigid spaced-apart relation at an end thereof, the said diverging conductive extensions being provided at the said other end of the pair of rigid conductors and each comprising a pair of horizontally spaced conductors terminally provided with a vertical loop, and the said mechanical securing means comprising mast-  
strapping means for strapping the said vertical loops, and--.

Claim 6, line 3 change "is" to: --being--.

Claim 8, cancel line 1 and substitute: --An antenna for ultra-high-frequency operation and the like, having, in combination, a pair of rigid conductors held spaced a predetermined vertical distance apart in a vertical plane, first and second pluralities of horizontal dipole elements lying in corresponding first and second vertically spaced horizontal planes containing the respective conductors, the dipole elements extending from opposite sides of each conductor at successive points therealong with dipole elements connected to one conductor extending in opposite horizontal directions to the corresponding dipole elements of the other conductor, the length of the dipole elements successively increasing from one end of the conductors towards the other end thereof, means for connecting a parallel-wire transmission line to the said one end of the conductors and means for mounting the antenna comprising a further pair of rigid diverging conductive extensions of

said conductors mechanically secured in rigid spaced-apart relation at an end thereof, --.

Claim 8, line 3, change "are" to: --being--. Same line, change "extend" to: --extending--.

Claim 13, cancel line 1 and substitute: --An antenna for operation over a predetermined frequency band, having, in combination, a pair of rigid longitudinal conductors held spaced a predetermined vertical distance apart in a vertical plane, first and second pluralities of dipole elements lying in corresponding first and second vertically spaced horizontal planes containing the respective conductors, the dipole elements extending from opposite sides of and transversely at an angle to each conductor at successive points therealong with dipole elements connected to one conductor extending in opposite direction to the corresponding dipole elements of the other conductor, the length of the dipole elements successively increasing from one end of the conductors towards the other end thereof, means for connecting a parallel-wire transmission line to the said one end of the conductors, rigid insulating means securing the said connecting means mechanically in spaced-apart relation and connected with means for supporting the transmission line near the said one end, and means for mounting the antenna at a region of the said conductors remote from the said one end, further rigid insulating means being provided for securing the said longitudinal conductors mechanically in rigid spaced-apart relation near the said region, --.

Ser. No. 325,511  
Amendment B  
Page Four

Claim 13, line 2, change "is" to: --being--.

Please delete without prejudice or disclaimer,  
claims 1 through 5, 7, 11 and 12.

Page 5, line 12, cancel "maximizing reception. For" .

REMARKS

While the applicants do not concur that the novel structures of the rejected claims are mere obvious expedients, none of the references even hinting at the same, let alone disclosing them, since the Office has indicated certain claims to be allowable that the applicants consider adequately protect the commercial embodiments of their assignee, it appears unnecessary to prolong the prosecution further, and the rejected claims are accordingly cancelled without prejudice or disclaimer.

The remaining claims having been allowed and being now, where appropriate, rewritten from independent form, reconsideration and allowance appear to be in order and are requested.

Very respectfully,

RINES AND RINES

By Attorneys for the Applicants

Get notes and video

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Laboratory Fee



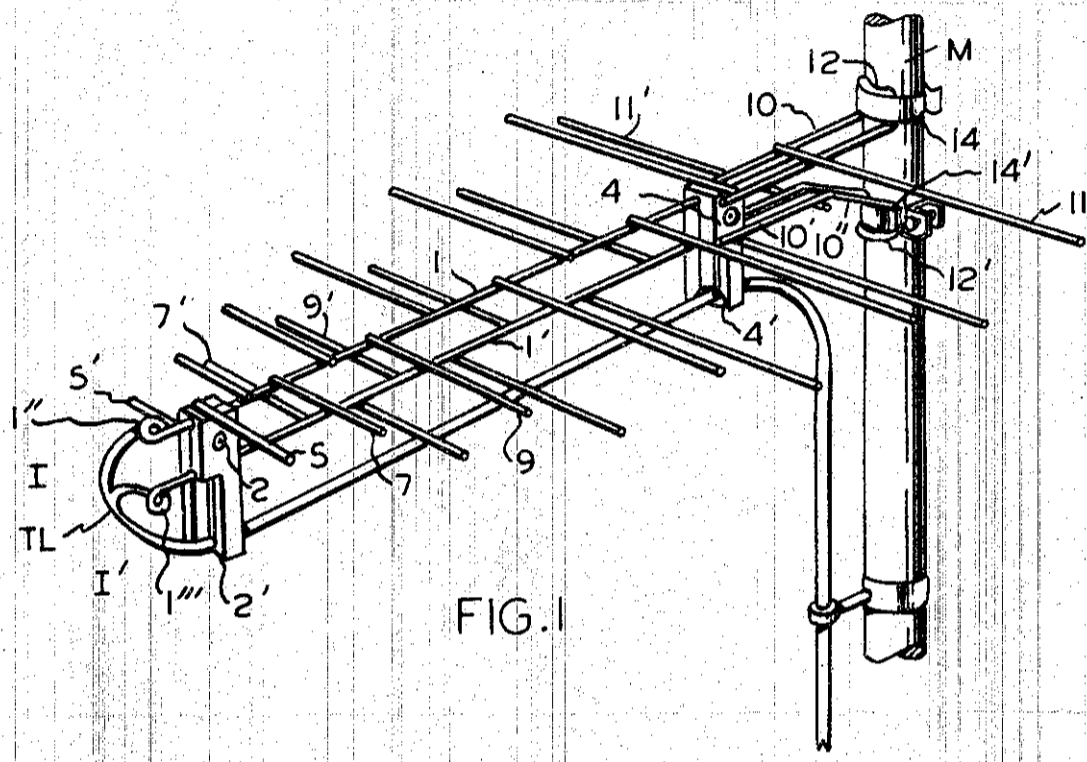


FIG. 1

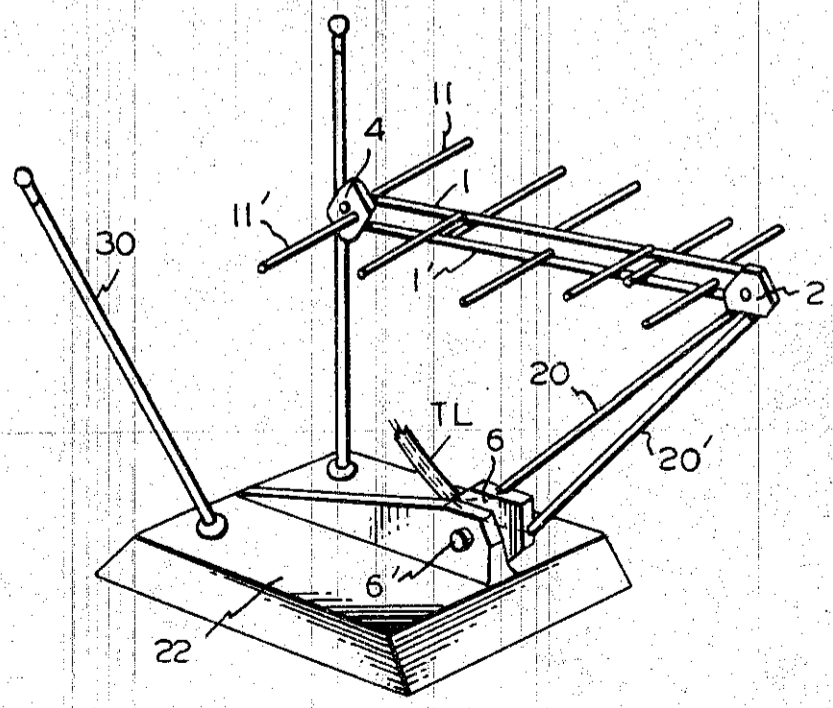


FIG. 2

INVENTORS  
 ISAAC S. BLONDER  
 ABRAHAM SCHENFELD

BY *Rines and Rines*  
 ATTORNEYS

*Mailed to P. O  
April 1, 1966  
KMP*

Paper No. 6

Letter to Office Draftsman

UNITED STATES PATENT OFFICE

ISAAC S. BLONDER ET AL

Ser. No. 325,511

Filed: November 21, 1963

Directive Antenna

Group 250

Boston, Massachusetts

April 1, 1966

*C. J. Blonder  
4/1/66*

Hon. Commissioner of Patents

Washington 25, D.C.

Sir:

The Office Draftsman is requested to correct the drawing as indicated in red in the accompanying copy, charging the cost to the account of the undersigned attorneys.

Very respectfully,

RINES AND RINES

By Attorneys for the Applicants

Paper No. 5  
Amendment B

*Mailed to P.O.  
April 1, 1966  
M/R*

UNITED STATES PATENT OFFICE

ISAAC S. BLONDER ET AL

Ser. No. 325,511

Filed: November 21, 1963

DIRECTIVE ANTENNA

Group 250

Boston, Massachusetts

April 1, 1966

*C/Blonder  
4/4/66*

Hon. Commissioner of Patents  
Washington 25, D.C.

Sir:

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transmission line to the said one end of the conductors and means for mounting the antenna comprising a further pair of rigid diverging conductive extensions of said conductors mechanically secured in rigid spaced-apart relation at an end thereof, the said diverging conductive extensions being provided at the said other end of the pair of rigid conductors and each comprising a pair of horizontally spaced conductors terminally provided with a vertical loop, and the said mechanical securing means comprising mast-  
strapping means for strapping the said vertical loops, and--.

Claim 6, line 3 change "is" to: --being--.

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Claim 13, cancel line 1 and substitute: --An antenna for operation over a predetermined frequency band, having, in combination, a pair of rigid longitudinal conductors held spaced a predetermined vertical distance apart in a vertical plane, first and second pluralities of dipole elements lying in corresponding first and second vertically spaced horizontal planes containing the respective conductors, the dipole elements extending from opposite sides of and transversely at an angle to each conductor at successive points therealong with dipole elements connected to one conductor extending in opposite direction to the corresponding dipole elements of the other conductor, the length of the dipole elements successively increasing from one end of the conductors towards the other end thereof, means for connecting a parallel-wire transmission line to the said one end of the conductors, rigid insulating means securing the said connecting means mechanically in spaced-apart relation and connected with means for supporting the transmission line near the said one end, and means for mounting the antenna at a region of the said conductors remote from the said one end, further rigid insulating means being provided for securing the said longitudinal conductors mechanically in rigid spaced-apart relation near the said region, --.

Ser. No. 325,511  
Amendment B  
Page Four

Claim 13, line 2, change "is" to: --being--.

Please delete without prejudice or disclaimer,  
claims 1 through 5, 7, 11 and 12.

Page 5, line 12, cancel "maximizing reception. For" .

REMARKS

While the applicants do not concur that the novel structures of the rejected claims are mere obvious expedients, none of the references even hinting at the same, let alone disclosing them, since the Office has indicated certain claims to be allowable that the applicants consider adequately protect the commercial embodiments of their assignee, it appears unnecessary to prolong the prosecution further, and the rejected claims are accordingly cancelled without prejudice or disclaimer.

The remaining claims having been allowed and being now, where appropriate, rewritten from independent form, reconsideration and allowance appear to be in order and are requested.

Very respectfully,

RINES AND RINES

By \_\_\_\_\_  
Attorneys for the Applicants

U.S. DEPARTMENT OF COMMERCE  
PATENT OFFICE  
WASHINGTON

In Reply Please Refer To: Group 250

Rines and Rines  
Ten Post Office Square  
Room 1318  
Boston 9, Mass.

Applicant: Isaac S. Blonder et al.	
Ser. No. 325,511	Mailed
Filed November 21, 1963	
For DIRECTIVE ANTENNA	
SHORTENED TIME FOR REPLY - 4/28/66	

Cited References Charge Data (If applicable)	
Deposit Account No.	No. of Copies

Please find below a communication from the EXAMINER in charge of this application.

Commissioner of Patents.

This application has been examined.

References:

3,086,206	4-63	Greenberg	343-815
3,150,376	9-64	Carrel et al.	343-792.5
3,212,094	10-65	Berry	343-792.5
(Filed 5-61)			
3,210,767	10-65	Isbell	343-792.5
(Filed 5-60)			
3,134,979	5-64	Bell	343-792.5
(Filed 1-61)			
3,108,280	10-63	Mayer et al.	343-792.5

There is no label showing Fig. 2 of the drawing. In this Fig., the transmission lines TL should be shown clearly preferably as a separate showing and its electromagnetic characteristics in relation to the antenna should be clearly defined.

Page 5, lines 10-17, what are the electromagnetic effects achieved by the specified lengths of diverging lines 2c, 20' and conductors 1, 1', and their exact relation to the reception.

Claims 1, 2, 3, 4, 5, 7, 11, 12, are each rejected on Isbell or Greenberg. Under 35 U.S.C. 103, there is no apparent patentable significance in providing various mechanical and clamp limitations in claims

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Serial No. 325,511

- 2 -

2, 3, 5, 7 other than design aspects or obvious  
mechanical expedients.

Claims 6, 8, 9, 10, 13, 14 are allowable  
if rewritten as independent claims.

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO  
THIS ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE  
OF THIS LETTER.

CBaraff:ap

WO-7-3277

ELI LIEBERMAN  
Examiner



U.S. DEPARTMENT OF COMMERCE  
PATENT OFFICE  
WASHINGTON

In Reply Please Refer To: **Group 250**

Rines and Rines  
Ten Post Office Square  
Room 1318  
Boston 9, Mass.

Applicant: <b>Isaac S. Blender et al.</b>		Mailed  .....
Ser. No. <b>325,511</b>	Filed <b>November 21, 1963</b>	
For <b>DIRECTIVE ANTENNA</b>		
<b>SHORTENED TIME FOR REPLY</b>		

Cited References Charge Data (If applicable)	
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Please find below a communication from the EXAMINER in charge of this application.

Commissioner of Patents.

**This application has been examined.**

**References:**

3,086,206	4-63	Greenberg	343-815
3,150,376	9-64	Carrel et al.	343-792.5
3,212,094	10-65	Berry	343-792.5
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There is no label showing Fig. 2 of the drawing. In this Fig., the transmission lines TL should be shown clearly preferably as a separate showing and its electromagnetic characteristics in relation to the antenna should be clearly defined.

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Claims 1, 2, 3, 4, 5, 7, 11, 12, are each rejected on Isbell or Greenberg. Under 35 U.S.C. 103, there is no apparent patentable significance in providing various mechanical and clamp limitations in claims

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2, 3, 5, 7 other than design aspects or obvious mechanical expedients.

Claims 6, 8, 9, 10, 13, 14 are allowable if rewritten as independent claims.

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS LETTER.



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CBaraff:ap

ELI LIEBERMAN

Examiner

WO-7-3277

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JAN 13 1966

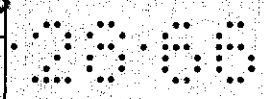
Paper No. 4

U.S. DEPARTMENT OF COMMERCE

PATENT OFFICE  
WASHINGTON

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Boston 9, Mass.

In Reply Please Refer To **Group 250**

Applicant: <b>Isaac S. Blonder et al.</b>	
Ser. No. <b>325,511</b>	Mailed
Filed <b>November 21, 1963</b>	
For <b>DIRECTIVE ANTENNA</b>	
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The enclosed references were cited in the office action identified above and are mailed to you in accordance with your authorization. Your deposit account, identified above, will be charged for the cost of these references.

**This application has been examined.** Commissioner of Patents

**References:**

<del>3,086,206</del> 4-63	Greenberg	343-815
<del>3,150,376</del> 9-64	Carrol et al.	343-792.5
<del>3,212,004</del> 10-65 (Filed 5-61)	Berry	343-792.5
<del>3,210,767</del> 10-65 (Filed 5-60)	Isbell	343-792.5
<del>3,134,000</del> 5-64 (Filed 1-61)	Bell	343-792.5
<del>3,108,280</del> 10-63	Mayer et al.	343-792.5

There is no label showing Fig. 2 of the drawing. In this Fig., the transmission lines TL should be shown clearly preferably as a separate showing and its electromagnetic characteristics in relation to the antenna should be clearly defined.

Page 5, lines 10-17, what are the electromagnetic effects achieved by the specified lengths of diverging lines 20, 20' and conductors 1, 1', and their exact relation to the reception.

Claims 1, 2, 3, 4, 5, 7, 11, 12, are each rejected on Isbell or Greenberg. Under 35 U.S.C. 103, there is no apparent patentable significance in providing various mechanical and clamp limitations in claims

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RINES AND RINES

NO. TEN POST OFFICE SQUARE, BOSTON, MASS. 02111 Reference Transmittal

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PO 5/5/65  
copy sent to  
I.S. Blonder 5/5/65*

Paper No. 3  
Amendment A

UNITED STATES PATENT OFFICE

ISAAC S. BLONDER

S.N. 325,511

Filed: November 21, 1963

Group 250

DIRECTIVE ANTENNA

Boston, Massachusetts

May 5, 1965

Hon. Commissioner of Patents

Washington 25, D. C.

Sir:

Please amend the above-numbered application  
as follows:

Page 3, line 10, before "conductors" insert:  
--longitudinal--.

Page 3, line 11, change "extending" to: --angularly  
extending transversely--.

Page 3, line 22, before the comma insert: --that  
secures the connecting portions 1'' and 1''' in spaced-apart  
relation--.

Claim 12, line 2, after "rigid" insert:  
--longitudinal--.

Claim 12, lines 4 and 5 and in line 10, cancel  
"horizontal".



Amendment

→ 325,511

Page 3, line 10, before "conductors" insert: -- longitudinal  
Page 3, line 11, change "extending" to: -- angularly  
extending transversely --.

Page 3, line 22, before the comma insert: -- that  
secures the connecting portions 1" and 1'" in spaced-apart  
relation --.

Claim 12, line 2, after "said" insert: -- longitudinal

Claim 12, lines 4+5, <sup>and in lines 4</sup> cancel "horizontal".

Claim 12, line 8, after "of" insert: -- and <sup>transversely</sup> ~~at an angle~~  
~~at an angle to~~ at an angle to --.

Claim 12, line 10, singularize "directions".

Claim 12, cancel from "and" line 4 from end,  
through the period in the last line and  
substitute: --, rigid insulating means securing  
the said connecting means mechanically in  
spaced-apart relation near the ~~said one end~~  
and <sup>connected with means for</sup> supported the transmission line near the said  
one end, and means for mounting the antenna  
at a region of the said conductors remote from the  
said one end, further rigid insulating  
means <sup>now provided for</sup> securing the said longitudinal conductors  
mechanically in rigid spaced-apart relation  
near the said region. --.

Claim 13, line 3, cancel "much".

longer repetitions,

REMARKS

Upon review of the above application, <sup>ambiguities and</sup> certain inaccuracies of language were noted in claim 12, which have been eliminated by the present amendments.

Respectfully submitted,  
Rena R. Lewis

By  
Attorney for the applicant