There have been so many wonderful letters of compliment about the #24 Bulletin that I could just about fill up 32 more pages with testimonials. Thanks. Only one complaint this time about the non-teletype material, and a whole raft of further urging.

The June issue of the Reader's Digest (page 25) had a fine article, "What is the Limit of Your Mind?" which says much of interest to those of you who have not particularly studied the mind and its possibilities. After reading this you may begin to get interested in doing research yourself on the subject and in keeping up with what is going on in that field. Even small successes in this field could have world-wide effect. Writes W4ZC/2, "Have been a worker in the fields of psychology and psychiatry for more than 20 years and that is one of the reasons that I have so little time to play with this durn RTTY. Average about 20 hours a week here in Newark at two different children's clinics. I enjoy the work and feel that occasionally we manage a minor miracle.

Being July; being HOT; being QRN'y; being vacation time; being lousy RTTY. Many reports of fishing, building, loafing; few reports of activity. But that is as one might be expecting, eh? The main thing is not to let things go too long so that you will be right where you are now come Fall and we again flourish on the bands. Now is the time to get busy and build the converter, get your tape gear, etc.

As promised, the big news this month is the circuit of the Northern Radio converter. True, this unit uses eight tubes, but if you will look carefully at the diagram you will note that the circuits are almost all just resistor-condenser circuits, and that the only filter system is in the first stage. The probability is strong that this circuit will soon be the "standard." We'll know more about that when a few fellows have built them up and tried them.
Toward the end of May my partner, John Karlson, and I
got in John's station wagon and headed for the RCA Parts
Show in Chicago. Out near Lima, Ohio the car hit a wet
curve and skidded into a ditch, turning completely over in
the process. Neither of us were hurt, fortunately, but the
car was in bad shape.

After having the car towed to a nearby garage we caught
a train for Chicago and left everything but some clothes
and a suitcase so we could return to Lima to determine out
to be very successful though since I had shipped one of
our Karlson enclosures by truck for use in the Bell Sound
System exhibit. The exhibit had the Electro-Voice Patrician
enclosure in one corner ($727), the Jensen Tri-Plex ($300)
in the other, and in the worst part of the room: the Karlson.
Even so, the contrast was so great that we were able to let
some of the top salesmen in the country come in and hear it
and sign them up. We now have manufacturer's representatives
in almost every section of the country. Most of our reps
also sell Bell amplifiers and Astatic cartridges, both being
the top selling item in their category.

Since returning home I have been busy supplying our reps
with all the literature and sales ammunition I could turn
out. Now, with nationwide distribution of the product by such
an outstanding group of reps; with our factory turning out
enclosures in ever increasing numbers to keep up with the
demand, it all amounts to what was featured in the Home's report in the
next issue of High Fidelity magazine (and an ad in the same
issue), with most of the mail order radio houses putting the
Karlson in their catalog, and with a good promotion and ad-
vertising campaign all set for fall (including a feature
article in Radio and Television News) we are getting in a
very good position to take advantage of the expanding high
fidelity market. Life, in the Coronation issue, estimated
that the sales of high fidelity equipment for 1953 would be
between 60 and 100 million dollars. This means a minimum of
$6,000,000 for enclosures. Since we have an attractive unit
which will outperform anything else available we should, if
we do any job at all on advertising, be able to get a good
slice of that market.

With the present tax setup it is impossible to expand a
business out of earnings, therefore we must raise additional
working capital from those interested in investing. Within
the next few weeks we should be incorporated and be able to sell
at the local office from which the messages originate. This keeps the balancing
and adjustment of polar and duplex equipment under the supervision
of skilled maintenance men. The local office keys a neutral
"Transmitting" relay at the main office; the contacts of this relay
connect the terminator and wire to the terminals thus sending polar signals over the long-distance circuit.
Incoming signals (polar) key a polar relay, the contacts of which
make and break the neutral "Central" circuit so that sending and receiving can be accomplished over the same wire if desired.

Because of the high keying speeds with low distortion possible
with polar relays they are also used for neutral operation in
preference to the neutral relays with which most amateurs are familiar
(magnet operated, spring returned). This is accomplished by "biased"
operation of the relay. To operate a polar relay in a neutral circuit a "bias" current of
30 M.A. is passed through one of the two windings on the relay in the
direction to move the armature to the "space" contact (generally the
left-hand contact). The 60 M.A. current from the neutral line is
sent through the other coil in the direction to overpower the "bias"
magnetization and move the armature to the "marking" contact. No
retracting spring is used. The 30 M.A. and the 60 M.A. are normally
series connected to the source so that no distortion of the signal will
occur if the line current varies because of generator output variations
or other causes.

A common error of radio amateurs is to consider that a low-voltage
polar relay will be as satisfactory for operating sensitive relays as a high-voltage source. For example: to pass 60 M.A. through one of the
65-ohm windings of a 216-A relay requires a potential of about 2.5 volts
between all 120 volt supply is used with a 2000-0hm "battery-
back" resistor. It is essential that this procedure be followed because
lack of sufficient series resistance will make the inductance of relay coil determine the rate of build-up and decay of the current.
By putting a 120 volt supply in parallel with the large signal, the current will be relatively independent of the inductance of the coil.
The importance of this will be seen when one realizes the relay must
"mark" immediately from dark-to-space or vice-versa in much less than
a thousandth part of a second.

The equivalent to polar-sending on a wire-telegraph line is radio
frequency "shift keying." In both systems no reliance is placed
on a spring-return armature during the spacing intervals
despite noise or variation in the strength of the signals.
FOR A COUPLE OF YEARS AMATEUR RADIO TELETYPE HEADQUARTERS HAS BEEN AWARE THAT NORTHERN RADIO HAD SOMETHING EXCEPTINOAL IN THE WAY OF A FREQUENCY-SHIFT CONVERTER BUT, UNTIL VERY RECENTLY, WE HAVE BEEN UNABLE TO GET THE "INSIDE DOPE" ON HOW WE COULD DO THIS SIMPLE, YET AMAZINGLY EFFECTIVE UNIT. COMPOSED MAINLY OF RESISTORS AND CONDENSERS ITS COST SHOULD BE VERY LOW AND ASSEMBLY EASY.

AT PRESENT THE IDEA EMBRACED IN THE MODEL 152 HAS BEEN CONFINED TO VERY HANEFER SHIFT CHANNELS "STACKED" CLOSERED ON WIRE TELEGRAPH LINES. THERE IS NO REASON WHY AMATEUR MAY NOT ADAPT THIS CIRCUIT TO OUR STANDARD 850 CYCLE SHIFT WITH EXCELLENT RESULTS. USING TECHNIQUES, THIS CIRCUIT ELIMINATES THE NEED FOR SEPARATE MARKING AND SPACING DISCRIMINATING AMPLIFIERS. UNLIKE THE FORSTER-SEELEY DISCRIMINATOR CIRCUIT WHICH REQUIRES A SPECIAL TRANSFORMER (TWO SPECIAL TRANSFORMERS IN THE WESTERN UNION TYPE 20 VERSION) THE NORTHERN RADIO DISCRIMINATING AMPLIFIERS. UNLIKE THE FORSTER-SEELEY DISCRIMINATOR CIRCUIT DETERMINES THE "CENTER-FREQUENCY" WITH A SINGLE INTEGRAL COIL-CONDENSER COMBINATION. THE "CENTER-FREQUENCY" PARALLEL-RESONANT COIL-CONDENSER COMBINATION. THE "CENTER-FREQUENCY" VALUES OF THIS COIL AND CONDENSER. FINE ADJUSTMENT CAN BE HAD WITH A TRIMMER.

THE AMONGING THING ABOUT THE MODEL 152 DISCRIMINATOR IS THE RAPIDITY OF ITS TRANSITION. ONCE THE OUTPUT HAVE SET THE "CENTER-FREQUENCY" THE OUTPUT OF THE CONVERTER WILL BE ALL "MARK" (60 MA CURRENT FLOW THROUGH SELECTOR MAGNET) WHEN YOU HAVE MOVED LESS THAN 2 CYCLES THROUGH SELECTOR MAGNET). WHEN YOU HAVE MOVED LESS THAN 2 CYCLES TO THE MARKING SIDE OF CENTER FREQUENCY WITH THE RECEIVED SIGNAL 2 CYCLES ON THE OTHER SIDE OF CENTER THE OUTPUT IS ALL "SPACE" (NO OUTPUT CURRENT TO SELECTOR MAGNET). THIS MAY SOUND DIFFICULT TO SWALLOW BUT IT IS TRUE.


EITHER THE FUNDAMENTAL SIGNAL FREQUENCY OR THE DOUBLET OUTPUT ARE APPLIED TO CATHODE FOLLOWER. THE OUTPUT OF WHICH DRIVES A SERIES-RESONANT CIRCUIT ACROSS ITS CATHODE RESISTOR. THE SECOND GRID IS DRIVEN BY A SIGNAL TAKEN FROM THE PLATE RESISTOR OF THE FIRST SECTION AND PRODUCES AN IDENTICAL SQUARE-WAVE VOLTAGE AT ITS CATHODE RESISTOR. THE SQUARE-WAVE VOLTAGE IS TAKEN OUT OF PHASE WITH THE GATE-VOLTAGE OF THE LIMITER. THESE TWO GATING VOLTAGES ARE APPLIED TO THE TWO CATHODES OF V-5 WHICH PERFORMS THE FUNCTION OF A COINCIDENCE DEVICE.

THE OUTPUT OF THE LIMITER IS ALSO LED TO THE GRID OF THE PHASE-SHIFT TUBE, V-4, IN WHOSE PLATE CIRCUIT THE SQUARE-WAVE IS CONVERTED BACK INTO A SQUARE-WAVE. THIS IS PLAT-LOOKING CIRCUIT PARM LENS BACK TO THE PARALLEL-RESONANT CIRCUIT (CONTAINED IN THE PLUG-IN UNIT). THE IMPORTANT THING TO NOTICE HERE IS THAT THE SQUARE-WAVE VOLTAGE FROM THE PARALLEL NETWORK WILL ONLY BE IN PHASE WITH THE SQUARE-WAVE ON THE GRID OF V-4 WHEN THE SQUARE-WAVE VOLTAGE IS AT THE "ZERO" FREQUENCY TO WHICH THE COIL IS TUNED. AT FREQUENCIES ABOVE OR BELOW THAT TO WHICH THE COIL HAD BEEN RESONATED THE SQUARE-WAVE WILL LEAD OR LAG THE SQUARE-WAVE WHICH GOES TO THE CATHODE DIODE.

THE OUTPUT OF THE LIMITER IS ALSO LED TO THE GRID OF THE PHASE-SHIFT TUBE, V-4, IN WHOSE PLATE CIRCUIT THE SQUARE-WAVE IS CONVERTED BACK INTO A SQUARE-WAVE. THIS IS PLAT-LOOKING CIRCUIT PARM LENS BACK TO THE PARALLEL-RESONANT CIRCUIT (CONTAINED IN THE PLUG-IN UNIT). THE IMPORTANT THING TO NOTICE HERE IS THAT THE SQUARE-WAVE VOLTAGE FROM THE PARALLEL NETWORK WILL ONLY BE IN PHASE WITH THE SQUARE-WAVE ON THE GRID OF V-4 WHEN THE SQUARE-WAVE VOLTAGE IS AT THE "ZERO" FREQUENCY TO WHICH THE COIL IS TUNED. AT FREQUENCIES ABOVE OR BELOW THAT TO WHICH THE COIL HAD BEEN RESONATED THE SQUARE-WAVE WILL LEAD OR LAG THE SQUARE-WAVE WHICH GOES TO THE CATHODE DIODE.

THE OUTPUT OF THE LIMITER IS ALSO LED TO THE GRID OF THE PHASE-SHIFT TUBE, V-4, IN WHOSE PLATE CIRCUIT THE SQUARE-WAVE IS CONVERTED BACK INTO A SQUARE-WAVE. THIS IS PLAT-LOOKING CIRCUIT PARM LENS BACK TO THE PARALLEL-RESONANT CIRCUIT (CONTAINED IN THE PLUG-IN UNIT). THE IMPORTANT THING TO NOTICE HERE IS THAT THE SQUARE-WAVE VOLTAGE FROM THE PARALLEL NETWORK WILL ONLY BE IN PHASE WITH THE SQUARE-WAVE ON THE GRID OF V-4 WHEN THE SQUARE-WAVE VOLTAGE IS AT THE "ZERO" FREQUENCY TO WHICH THE COIL IS TUNED. AT FREQUENCIES ABOVE OR BELOW THAT TO WHICH THE COIL HAD BEEN RESONATED THE SQUARE-WAVE WILL LEAD OR LAG THE SQUARE-WAVE WHICH GOES TO THE CATHODE DIODE.

THE OUTPUT OF THE LIMITER IS ALSO LED TO THE GRID OF THE PHASE-SHIFT TUBE, V-4, IN WHOSE PLATE CIRCUIT THE SQUARE-WAVE IS CONVERTED BACK INTO A SQUARE-WAVE. THIS IS PLAT-LOOKING CIRCUIT PARM LENS BACK TO THE PARALLEL-RESONANT CIRCUIT (CONTAINED IN THE PLUG-IN UNIT). THE IMPORTANT THING TO NOTICE HERE IS THAT THE SQUARE-WAVE VOLTAGE FROM THE PARALLEL NETWORK WILL ONLY BE IN PHASE WITH THE SQUARE-WAVE ON THE GRID OF V-4 WHEN THE SQUARE-WAVE VOLTAGE IS AT THE "ZERO" FREQUENCY TO WHICH THE COIL IS TUNED. AT FREQUENCIES ABOVE OR BELOW THAT TO WHICH THE COIL HAD BEEN RESONATED THE SQUARE-WAVE WILL LEAD OR LAG THE SQUARE-WAVE WHICH GOES TO THE CATHODE DIODE.

THE OUTPUT OF THE LIMITER IS ALSO LED TO THE GRID OF THE PHASE-SHIFT TUBE, V-4, IN WHOSE PLATE CIRCUIT THE SQUARE-WAVE IS CONVERTED BACK INTO A SQUARE-WAVE. THIS IS PLAT-LOOKING CIRCUIT PARM LENS BACK TO THE PARALLEL-RESONANT CIRCUIT (CONTAINED IN THE PLUG-IN UNIT). THE IMPORTANT THING TO NOTICE HERE IS THAT THE SQUARE-WAVE VOLTAGE FROM THE PARALLEL NETWORK WILL ONLY BE IN PHASE WITH THE SQUARE-WAVE ON THE GRID OF V-4 WHEN THE SQUARE-WAVE VOLTAGE IS AT THE "ZERO" FREQUENCY TO WHICH THE COIL IS TUNED. AT FREQUENCIES ABOVE OR BELOW THAT TO WHICH THE COIL HAD BEEN RESONATED THE SQUARE-WAVE WILL LEAD OR LAG THE SQUARE-WAVE WHICH GOES TO THE CATHODE DIODE.

THE OUTPUT OF THE LIMITER IS ALSO LED TO THE GRID OF THE PHASE-SHIFT TUBE, V-4, IN WHOSE PLATE CIRCUIT THE SQUARE-WAVE IS CONVERTED BACK INTO A SQUARE-WAVE. THIS IS PLAT-LOOKING CIRCUIT PARM LENS BACK TO THE PARALLEL-RESONANT CIRCUIT (CONTAINED IN THE PLUG-IN UNIT). THE IMPORTANT THING TO NOTICE HERE IS THAT THE SQUARE-WAVE VOLTAGE FROM THE PARALLEL NETWORK WILL ONLY BE IN PHASE WITH THE SQUARE-WAVE ON THE GRID OF V-4 WHEN THE SQUARE-WAVE VOLTAGE IS AT THE "ZERO" FREQUENCY TO WHICH THE COIL IS TUNED. AT FREQUENCIES ABOVE OR BELOW THAT TO WHICH THE COIL HAD BEEN RESONATED THE SQUARE-WAVE WILL LEAD OR LAG THE SQUARE-WAVE WHICH GOES TO THE CATHODE DIODE.
Northern Radio Company
Dual F.S. Tone Converter
Type 152

By Permission Mr. C. Lambert
Northern Radio Company, Inc.

NOTES:
1. ALL RESISTANCES IN OHMS
2. ALL CAPACITANCES IN MICROFARADS
UNLESS OTHERWISE SPECIFIED

Although the "FLIP-FLOP" PLATE CURRENT will follow the keying of the distant teletype, it does not have sufficient amplitude to key the local printer and, thus, a d.c. amplifier stage is required, To amplify the d.c. signal, it is permissible for intermediate coupling, the grids of the keyer tubes are directly connected to the plates of the "FLIP-FLOP," through resistors, r-39 and r-53 and the "sense" switch (which determines whether an increasing input frequency produces marking or spacing output), and the high positive voltage on the grids is cancelled by an equally high negative voltage applied through r-40 and r-52. This high negative voltage is rectified by CR-2 (the only unconventional item in the assembly which consists of a 600 volt 1.5 M.A selenium rectifier) made by I.R.G.O. from the high-voltage winding of the power transformer. A satisfactory amateur substitute for this item might be a 625 rectifier tube.

The model 152 is connected to provide only "neutral" output but an output tube is used, which is keyable on the spacing signals in order to maintain a load on the unregulated plate supply. 0-2 (the only unconventional item in the assembly which consists of a 600 volt 1.5 M.A selenium rectifier) may be developed. Unless the printer already has a suitable shunt a combination of a 1/2 M.A. 600 volt condenser and a 1/2 watt resistor in series, should be shunted across the printer selector magnet to absorb the "kick." The Northern Radio Model 152 converter was designed to operate the printer directly without the use of a polar relay, which eliminates filtering of the relay contacts for radio interference. If the circuit is used with a printer requiring a polarized relay, the output current can be reduced to 20 M.A.

The model 152 is assembled on a 3-1/2" x 1/2" standard rack panel with two complete channels including separate power supplies occupying one panel. The units, containing the input filter and the discriminator coil, plug into the rear of the chassis. If the converter is connected directly to a printer, and not via a telegraph keyer, the output transformer is connected in series with the converter output terminals. In the multi-channel wire-line service, for which it was designed, the frequency is shifted plus-and-minus 42-1/2 cycles around the nominal "center frequency." The center frequency of most interest to radio amateurs is 2550 C.P.S., as it is around that frequency that we shift the other is at cut-off but, and not via a telegraph keyer, the output transformer is connected in series with the converter output terminals. In the multi-channel wire-line service, for which it was designed, the frequency is shifted plus-and-minus 42-1/2 cycles around the nominal "center frequency." The following is a list of those few parts not completely identified in the drawing:

T-1 POWER TRANSFORMER
SECONDARY: 295-0-295 V. AT 90 M.A.
900 OHMS, 6.3 V. AT 2 AMPS.
L-1 FILTER Choke
SECONDARY: 7 M.H.
100 OHMS D.C.
R-41 OUTPUT CONTROL
50,000 OHMS, 2 WATT POTentiometer
R-55 FILTER RESISTANCE
900 OHMS, 5 WATTS, WIREWOUND
R-56 FILTER RESISTANCE
T-2 ISOLATION TRANSFORMER LINE-TO-GROUND
M-1 OUTPUT METER
0-75 M.A. FULL SCALE
DATA ON PLUG-IN UNITS:
CENTER FREQUENCY
C-100 C-101 C-103 L-100
2465 C.P.S. 0.01 0.001 1300-2830 M.W.
3 HENRY TOROID
2635 C.P.S. 0.01 0.005 1300-2830 M.W.
C-102 C-104 C-105 C-106 C-107, L-101, R-101 NOT USED AT THESE FREQUENCIES.

This is the circuit of a non-doubling plug-in discriminating unit. The BP100 filter is a band-pass filter.

Dr. Ossip Schmalpibelle of the University of Kornepustum announces discovery that all flies incident upon flypaper do not stick but that there is a finite probability of a fly rebonding with a constant value. If polar output is desired for amateur radioteletype operation it is obvious that very little modification of the circuit will be required. A screen potentiometer r-41 permits adjustment of the output current to exactly 60 M.A. (or any other desired value) and it will be seen that it simultaneously adjusts the "space" tube so that the "dummy" load is always the same as the printer load. Because the keying of the indicator printer-tube is very abrupt high back-e.m.f. voltages, endangering the printer-magnet insulation, may be developed. Unless the printer already has a suitable shunt a combination of a 1/2 M.A. 600 volt condenser and a 1/2 watt resistor in series, should be shunted across the printer selector magnet to absorb the "kick."
AMATEURS USING SINGLE-MAGNET TTY TYPEWRITERS SUCH AS MODELS 14, 15, 19, 24, 26, 28, 31 AND WESTERN UNION 100 SERIES MACHINES AND CREED, AUTOMATIC ELECTRIC AND KLEINSCHMIDT PRINTERS HAVE ASKED HOW THESE MACHINES MAY BE CONNECTED WITH BOTH MODELS OF THE STANDARD "WBFD" PANEL.

THE SIMPLE SERIES CIRCUIT OF A 2000 OHM WIRE-WOUND RESISTOR TO THE ARMATURE AND "MARK" CONTACTS OF THE POLAR RELAY, THE PRINTER MAGNET AND THE 120 VOLT D.C. CURRENT SUPPLY OBTAINED FROM TERMINALS 8 & 9 OF THE 11-PIN CONNECTOR ON THE PANEL IS ALL THAT IS NEEDED. NO CHANGES NEED BE MADE IN THE PANEL ITSELF. THE ITEMS MENTIONED MERELY CONNECT TO AN 11-PIN (FEMALE) CONNECTOR MATING WITH THE PANEL (MALE) CHASSIS CONNECTOR.


A 0-100 M.A. METER SHOULD BE IN THESE LOOPS AS THE PRINTERS PROVIDE MINIMUM DISTORTION OF THE SIGNALS AT THIS CURRENT. THE 2000 OHM RESISTORS MAY HAVE TO BE INCREASED IF THE SUPPLY IS SUBSTANTIALLY OVER 120 VOLTS. THE INTERNAL METER-SWITCHING SYSTEM CAN BE MODIFIED TO INCLUDE A METHOD OF MONITORING THE LOOP CURRENT. (CONF SET THE CURRENT IS UNLIKELY TO VARY SO IT IS NOT VERY IMPORTANT TO HAVE A PERMANENT METER IN THE LOOP).

ON THE Latest PANEL THE "RETRANSMIT" RELAY (SECOND FROM THE TOP OF THE PANEL) CAN BE USED TO OPERATE SINGLE-MAGNET PRINTERS OR REPERFORATORS WHILE THE TOP RELAY CAN OPERATE A 5-MAGNET PRINTER SIMULTANEOUSLY.

A TRICK ROUTED TO IN COMMERCIAL TTY TYPE USE WHEN THE D.C. 120 VOLT SUPPLY DOES NOT HAVE GOOD REGULATION IS TO KEY THE SINGLE-MAGNET PRINTER WITH THE "MARKING" CONTACT OF THE POLAR RELAY AND CONNECT A "DUMMY" LOAD RESISTANCE TO THE "SPACING" CONTACT OF A VALUE CALCULATED TO DRAW APPROXIMATELY THE SAME CURRENT AS THE PRINTER. THE OUTPUT FILTER CONDUCT IN THE RECTIFIER UNIT CANNOT APPRECIABLY CHARGE UP DURING THE "SPRING" INTERVAL THE ARMATURE OF THE RELAY IS IN TRANSIT AND, THUS, MAINTAINS THE VOLTAGE CONSTANT. 73 DE WBFD

VE2AVU in the call that Lou Buck was just recently issued. Lou had let his old license expire and, with the impetus of teletype, recently decided to get back on the air again. Lou has helped a lot of the Canadian gang get their printers and it will be well worth being able to work him on the air. Naturally his first out of town contact was Bob, W9TCJ. He also contacted VE3GL in Toronto, which is doing well considering that he is only running 75 watts to a 12 foot whip antenna.

Though things are supposed to die down in the Summer, I have been daily surprised at the number of letters coming in and wish to thank you for taking the trouble to write. With but two exceptions most of the letters register an interest in my occasional aversions from the RTTY line which to me is encouraging.

DL1KX sent a hamsgram saying, "I am all set here for radio teletype. Drop me a line via airmail if you or anyone else is interested in making a schedule." Martin E. Wilson, 1945 AACS Sgt. APO 57, Postmaster, N.Y., N.Y. There's some DX.

Send your check or money order to: G.L. Electronics
905 S. Vermont Ave.
Los Angeles 6, Cal.

MODEL 26 PAGE PRINTERS:
RECENTLY RELEASED FOR AMATEUR USE.

PERFECT CONDITION:
DRESSES UP THE SHACK.

LOOKS GOOD FOR DEMONSTRATIONS.

GIVES YOU PRIDE OF OWNERSHIP.

SINGLE MAGNET OPERATION FOR BEST RADIO USE:
OPERATES RIGHT OFF THE CONVERTER!

NO V.T. KEYER CIRCUITS NEEDED!

SMALL SIZED:
EASILY PORTABLE.

MUCH MORE COMPACT THAN THE MONSTER MODEL 12.

CLEAN, SHARP TYPE:
USE IT AS A TYPEWRITER.

FINE FOR CORRESPONDENCE.

QUIET:
EXCELLENT FOR APARTMENT USE.

NO MORE S-9 NOISE LEVEL, WORK THE WEAK ONES.

AVAILABLE IMMEDIATELY:
WHY WAIT SIX MONTHS TO GET ON THE AIR?

THE PRICE IS RIGHT:
SEND $225 RIGHT NOW-

THERE ARE ONLY FIVE.

DON'T BE DISAPPOINTED.