VALLEY 415/815
OWNERS MANUAL

PURPOSE

The Dynamic Sibilance Processor is designed to remove sibilance from mixed program material without effecting tonal quality.

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INTRODUCTION

Thank you for purchasing the Valley People Dynamic Sibilance Processor Model DSP 415 (rack mount) or DSP 815 (modular). We are certain it will give you years of trouble- free operation and service. Valley Products are manufactured to the highest standards in Nashville, Tennessee, using quality components and materials. We have over a decade of experience in the manufacture and installation of products used in various facets of the professional audio industry.

Since 1969, Valley has been dedicated to designing and building signal processing devices that provide the user with ultimate value and function. The reliability and performance of Valley People products is recognized by recording and broadcast engineers, as well as commercial installers world-wide.

If you have any question regarding application or operation of the DSP 415/815 or any other Valley product, please feel free to call us at any time at 615/383-4737 and ask for our customer service department.

DESCRIPTION

In this section, we shall be discussing terms which may be new to you. For this reason, we have included a brief glossary.

Dynamic: undergoing continuous change; possessing the

ability to continuously alter shape, function or other parameters.
Fricative: a consonant sound that is formed by forcing the passage of breath through a narrow aperture in the vocal tract, thus producing audible friction.
Phoneme: a sound used in speech to separate and distinguish utterances, such as the "p" and "t" sounds in the English words "pin" and "tin".
Sibilance: component of fricative sound in human speech composed mostly of high frequency sinusoidal information, or "whistles".

Sibilance control is one of the least understood of signal processing procedures, despite sibilance being an extremely common problem.

Prior to the invention of the DSP, the only counter-measure to this difficulty was a de-esser; literally an "S remover." The DSP, however, is a unique signal processing tool, containing previously unavailable proprietary Valley People technology. It deals with sibilance problems effectively and efficiently; but do not expect it to be "just another de-esser". The Dynamic Sibilance Processor is a totally different device, as we shall explain, but first, let's take a look at what causes sibilance problems.

THE CAUSE OF SIBILANCE PROBLEMS

The frequent culprit in sibilance difficulties is not so much the offending consonant, but various speech artifacts that create a whistling sound. Quite often, when certain phonemes are pronounced, they produce a fricative. This audible friction or frication (occurring around 6kHz) when passed through the signal chain, produces artifacts that, when combined with transducers, equalizers etc., result in an objectionable whistle on top of the "S" sound. This phenomenon can also be caused by non-fricative sounds, such as dentals.

HOW A DE-ESSER WORKS

A de-esser works on the "S" sound. If someone has pronounced a sibilant "S", a de-esser will reduce its gain when that "S" comes along because it is frequency-sensitive. It does this by means of an equalized control circuit operating a gain reduction device. In the presence of the "S" sound or any sounds having a predominantly high frequency content, the gain is reduced automatically.

Sibilance can be quite difficult to deal with when broadcasting, recording, or at the cutting lathe. Previously (at least up until now), you would use a de-esser to remove the offending consonants from magnetic existence...the problem is that you remove program material at the same time.

Someone who is a frequent sibilant offender can wreak havoc in a mix, while the use of a de-esser will create holes in the program that must be dutifully covered up, because when removing the "S" sound with a de-esser, everything coincidental with the "S" sound goes away with it. This is especially problematic in mixed program material, since any time there is an "S", you hear the de-esser operate, leaving a hole in the program.

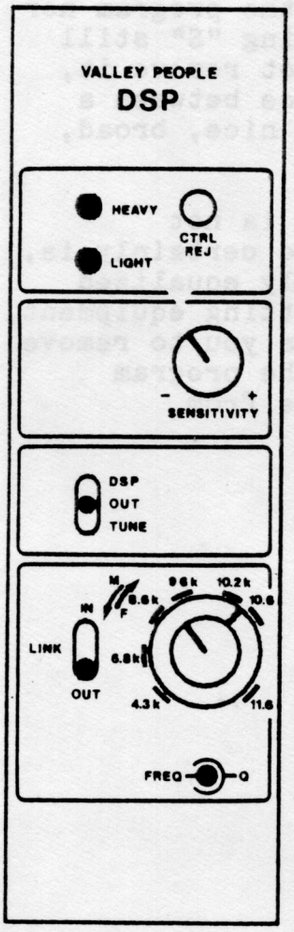
HOW THE DSP WORKS

The Dynamic Sibilance Processor operates very differently from a de-esser. It does not work on the "S" sound, but rather on the resulting artifact or whistle. By removing only the whistle, you are able to leave the program material intact; you do not create a hole in the program nor do you effect the "S" in any way. The resulting "S" still sounds like it should, because the DSP does not remove it, but "softens" it. The DSP makes the difference between a pronounced whistle accompanying the "S" and a nice, broad, "S" sound.

Remember: the fricative "S" sound itself is not problematic to reproduce; the sibilant whistle certainly is, particularly when you are working with a highly equalized signal chain such as a tape recorder, disc cutting equipment, or FM transmitting equipment. The DSP allows you to remove the objectionable whistle without affecting the program material. The result is a clean program, free from sibilance.

FRONT PANEL CONTROLS

The illustration on this page explains the function of each of the DSP front panel controls. The 815 is shown; the front panel controls of the 415 are identical both in function and in nomenclature, but are turned 90 degrees to accomodate the horizontal format of the 415.



LED Indicators provide visual correlation of DSP action. The Max (maximum) green LED indicates that the DSP has located sibilance within its assigned pass band and is removing it. The Min (minimum) LED yellow LED indicates that the DSP is on the threshold of operation, causing 3 dB of tone suppression at its assigned center frequency.

The Ctrl Rej.trimmer potentiometer is accessible through the front panel. This trim removes dc offset from the line driver stages which may be caused by the DSP control circuitry. It may also be considered a "noise-nulling" trimmer, since the dc offset manifests itself audibly as shot noise, a kind of "grainy" sound when low-level information or even just tape hiss is passed through the DSP during normal operation.

The Sensitivity control determines how sensitive the DSP control circuitry becomes to information within its pass band. This control is not level dependent, because the DSP constantly compares the level of information within its pass band to the broadband energy present at its input.

The DSP mode switch selects the operational configuration of the unit.

DSP position enables the control circuitry.
Tune position routes the output of the DSP's bandpass filter to the line driver input as an aid to setting up the device.
Out position defeats the control circuitry and applies the input signal directly to the line driver input at unity gain.

The Link switch connects the control circuitry to an external Link buss, thus allowing two or more modules to track dynamically when all their Link switches are placed in the In position. The Link function does not affect bandpass frequency or "Q".

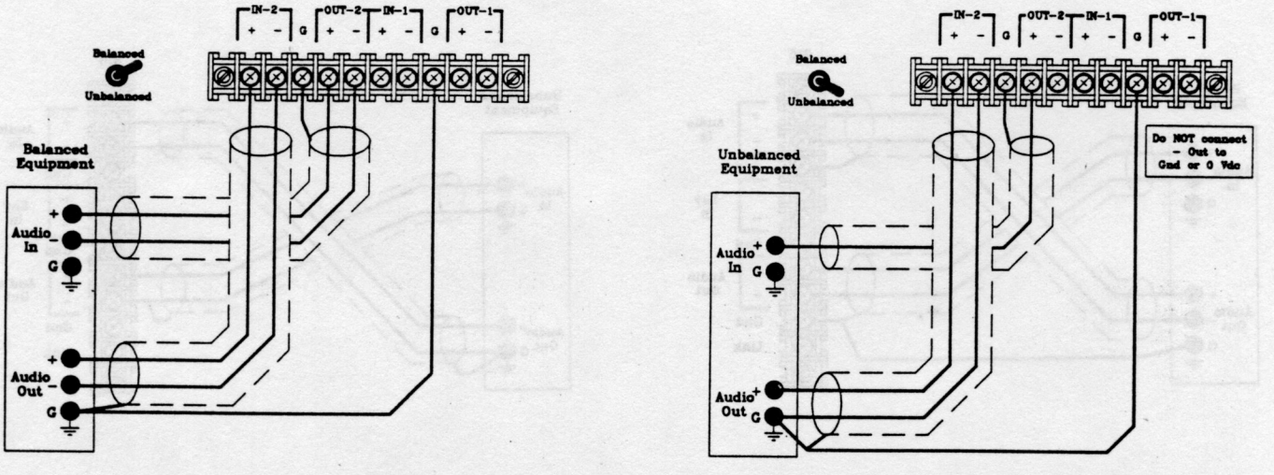
The filter controls are concentric knobs. The outer knob, labelled "Q" determines the bandwidth of the control circuitry bandpass filter, or how wide the control pass band is. Fully CCW represents the widest pass band, while fully CW in the narrowest. The inner knob, labelled Freq., determines the center frequency of the control pass band, and is adjustable from 4 kHz to 16 kHz.

CONNECTIONS

DSP 415 CONNECTIONS

The 415 19" rack mounted DSP features balanced inputs and outputs. By selecting the appropriate position of the output mode switch, the connectors may be configured as unbalanced, or differentially balanced low impedance line drivers. Follow the interconnect diagram, Figure 1, when connecting the 415 to other equipment.

415



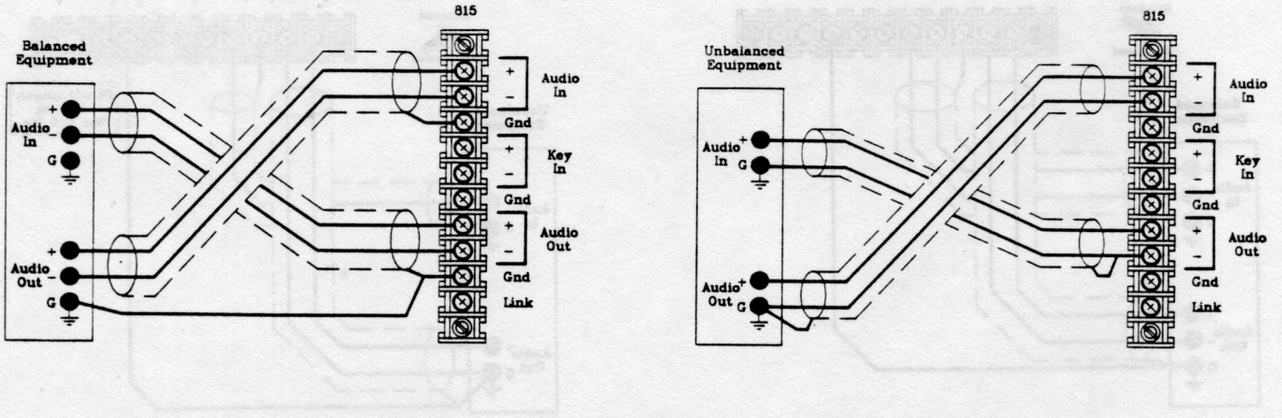
DSP 815 CONNECTIONS

The 815 modular DSP is designed to be housed and powered by the Valley 804, 806, PR-2 and PR-10 equipment racks. The 815 features a balanced input and an unbalanced output.

When using the Valley 800 series racks to accommodate two 815 modules for stereo processing, the Link buss is assigned to the barrier strip terminal marked Key In +. To link the 815 modules, connect the appropriate Key In + terminals. The Valley PR-2 equipment rack incorporates an internal coupling buss which is activated by pressing the Link switch on the front panel.

The Valley PR-10 equipment rack features a Link terminal at position 10 on the rear barrier strip. Position 10 must be connected to the corresponding terminal on the second 815 to stereo couple two devices. Follow the interconnect diagram, Figure 2, when connecting the 415 and other equipment.

815



TUNING THE SYSTEM

1) Switch to TUNE mode.
2) Monitor one channel at a time.
3) Adjust "Q" control to approximately the 2 O'clock position.
4) Adjust Sensitivity Control between 10 and 12 O'clock.

5) Listen to "S" sounds for objectionable whistling.
6) Turn Center Frequency Control until you can hear sibilance and see the green light flashing indicating the presence of objectionable sibilance. This usually will be somewhere between 6 and 12kHz.
7) Switch to DSP mode and check operation.
8) Switch both units to Link, if stereo coupling is desired. Align other unit's controls to the same positions. The DSP should be stereo linked only for extremely accurate operation, e.g. disc mastering. When linked, both units respond identically to a dynamic signal. If the controls are set identically they will operate identically as well as maintain center image.
9) Back "Q" control to about the 10 o'clock point. This is performed while listening to subjectively determine the optimum sound.

Note: During most program material the LED indicators will flash on transients such as rim shots. A/B the mix with the DSP in and out. If noticeable coloration of the high-frequencies occurs, reduce the sensitivity of the DSP, or increase the "Q" control setting.

APPLICATION

The DSP may be used on voice, vocals, or mixed program material. You'll find it especially useful for disk mastering and broadcast applications.

In addition to removing sibilance, the DSP may be used wherever there is sporadic high frequency noise and you cannot use an equalizer because its presence would be noticeable.

You may find other uses, for example, as a dynamic notch filter to remove feedback, sync noise, or high frequency artifacts caused by certain types of digital filters. You might even discover an application that you would like to share with us.

ADJUSTING THE CONTROL REJECTION

The control rejection potentiometer Ctrl Rej. removes any dc offset voltage which may appear at the output of the VCA section of the DSP, and affects the ability of the VCA to operate quietly without control voltage feedthrough.

If the control rejection adjustment is not made correctly, the DSP will produce a noisy, "gritty" sound when a low level signal or noise is passed through it.

To adjust the control rejection potentiometer, feed the DSP with a noise source; this can be any random noise having a level less than -40 dB, such as open microphone noise, circuit noise, white or pink noise. Monitor the output of the DSP at high gain so that you can easily hear the noise. With the DSP Mode switch in the DSP position, adjust the Q control to 12 o'clock, and set the Frequency control at about 10 o'clock. Turn the Sensitivity control to the point where the yellow LED remains lit and the green LED is flashing intermittently. If a crackling sound is heard which seems to correspond to the flickering of the green LED, the control rejection potentiometer should be adjusted to eliminate it. Adjust the control rejection potentiometer slowly, since rapid adjustment will cause "thumping" sounds, making it impossible to determine when the crackling noise is nulled.

SPECIFICATIONS

Input	GUARANTEED	TYPICAL	UNITS
Input Impedance, bal.:	100	---	kohm
Input Impedance, unbal.:	50	---	kohm
Maximum Input Level @ 1 kHz, balanced:	+24	+25	dB
Maximum Input Level @ 1 kHz, unbalanced:	+24	+25	dB
Range of Input Levels for 0 dB Output:	±1.5	±.5	dB
Input CMRR @ 50-60 Hz. (ref. input):	>60	63	dB
Output			
Output Source Impedance, unbalanced (415, 815):	⩽20	---	ohm
Output Source Impedance, balanced(415 only):	⩽40	---	ohm
Maximum Output Level into 600 ohm, bal. (415 only):	+24	+25	dBm
Maximum Output Level into 600 ohm, unbal.(415, 815):	+18	+19	dBm
Static 1 kHz THD @ 0 dB in, Unity Gain:	<.01	.003	%
Static IMD per SMPTE @ 0 dB in, Unity Gain:	<.01	.002	%
Output Noise and Hum, Rsource=600 ohm, Rload =600 ohm:	-90	-92	dB

NOTE: 0 dB refers to 0.775 Vrms;
All noise measurements made with rms-responding meters in a 20 kHz noise bandwidth; THD measurements made with 3rd order low-pass filter having -3 dB point @ 30 kHz.

SPECIFICATIONS (CONTINUED)

Power Supply (415 only)

Mains Input Voltage: 90-130/190-250 Vac, 50-60 Hz

Power Consumption: 12 VA Max.

Uses standard IEC cord and connector set.

RF and transient protection provided in power supply.

Power Requirements (815 only)

±15 Vdc, 65 mAdc nominal.

Mechanical

The Model 815 DSP is fabricated on a 4.5"X9.2" pc card complete with a 1.5" wide front panel designed to be housed and powered by one of the Valley 5.25"X19" (482 mmX3u) rack mount enclosures, (TR804, TR806, PR-10) or the Valley PR-2 1.75"X19" (482mmX1u) powered enclosure.

The Model 415 DSP is packaged in a 1.75"X19" (482mmX1u) steel rack mount package 8.5" (216mm) deep.

THE VALLEY PRODUCT LINE

810 KEPEX II

The KEyable Program EXpander is the world's most versatile noise gate and expander. Its variable slope and variable attack and release times suit it to all production noise reduction chores.

APPLICATIONS: Noise reduction; Noise gating for percussion instruments; Electronic music effects.

PACKAGE: 800 series module

811 GAIN BRAIN II

Gain Brain's Linear Integration Detection and Peak Reversion Correction allow this limiter/compressor to preserve correct musical relationships throughout the audio spectrum.

APPLICATIONS: Limiting vocals, string instruments, etc.;Enhancing apparent loudness of mixed program; "Duck" function performs voice-over gain reduction.

PACKAGE: 800 series module

812 MAXI-Q

This 3-band fully parametric equalizer features an unique tune mode for rapid set-up and a 7 octave range for each of the three filter sections providing unsurpassed flexibility and ease of operation.

APPLICATIONS: Notching objectionable noises such as acoustic feedback; General use as filter set; may be used in conjunction with dynamics processors for vocal stressing, de-essing, frequency selective gating, or other interactive signal processing functions.

PACKAGE: 800 series module

815 DYNAMIC SIBILANCE PROCESSOR

This unique tool allows sibilance to be removed from vocal tracks and even completed mixes without affecting or coloring the program information.

APPLICATIONS: Removing sibilance from master tapes when cutting master disks; Control of sibilance for FM broadcasting; Removal of sporadic high frequency noise without added coloration.

PACKAGE: 800 series module

PR-2

Valley's 800 series modules may be housed and powered by this 2-module, 1.75"X19" (482mmX1u) enclosure. Ideal for stereo processing using any two Valley modular products, or for interactive signal processing using Maxi-Q and Kepex or Gain Brain.

PR-10

The PR-10 is a 5.25"X19" (482mmX3u) enclosure is designed to house and power up to ten 800 series modules.

Valley's new rugged rack design features split power sources and tough aluminum and steel construction, perfect for road use or for permanent installations.

400 MICROPHONE PROCESSOR

Combining a high quality, low-noise microphone pre-amplifier with a full complement of processing functions including EQ, limiting/compression, expansion and gating, the Model 400 is the complete microphone channel processor. Among the features of this product are a Volume Indicator (vu meter) and separate gain reduction meter, a pre-fader patch for outboard processing or processor-only access, a de-esser, and switch-selectable line level/microphone level balanced output.

APPLICATIONS: Live studio broadcast; ENG and ENG post-production; Mix minus interface for on-air consoles, audio and video production.

PACKAGE: 1.75"X19" (482mmX1u) rack mount enclosure

415 DUAL DYNAMIC SIBILANCE PROCESSOR

This device is a must for any post-production facility, including disk mastering and audio for video. By identifying and removing only objectionable sibilance from vocal information, including that in mixed material, the 415 does what no de-esser could ever do...suppression of sibilance without coloration of the remaining program information. The two DSP channels may be linked for stereo operation or used independently.

APPLICATIONS: Removal of sibilance from spoken word or mixed musical material without the adverse artifacts created by use of a de-esser.

PACKAGE: 1.75"X19" (482mmX1u) rack mount enclosure

430 DUAL LIMITER/EXPANDER/GATE

This multi-function signal processor can perform any of 18 variations of limiting, gating, expansion, AGC, envelope following, keying, or voice-over gain reduction.

APPLICATIONS: General production and post production processing and sweetening. May be coupled for stereo operation or used as a two channel device.

PACKAGE: 1.75"X19" (482mmX1u) rack mount enclosure

440 LIMITER/COMPRESSOR/EXPANDER

Only from Valley could you expect so much signal processing power in a single unit. The Model 440 can simultaneously compress, limit, expand, and perform dynamic sibilance processing for suppression of objectionable sibilance in mixed material. An "Auto" control mode reduces set-up of the compressor and expander sections to the selection of more or less processing at the turn of a single control. Use of Linear Integration, Peak Reversion

Correction, Anticipatory Release Computation, and fully interactive control assures freedom from processing artifacts and distortion. The 440 is the best dynamics processor on the market today at any price.

APPLICATIONS: AGC and compression/expansion for broadcast; Production and post-production sweetening; AGC/compression, limiting, and clipping for uplink program feeds; compression and sibilance suppression for all post-production processes.

PACKAGE: 1.75"X19" (482mmX1u) rack mount enclosure

610 DUAL COMPRESSOR/EXPANDER

By combining the best features of Valley technology, such as Linear Integration, Peak Reversion Correction, and symmetrical release, the 610 provides the capacity to perform interactive expanded compression so imperceptibly, you may not believe your ears. This device has been called the best available by producers and mastering engineers world-wide because of its incomparable transparency and ease of operation. The 610 simultaneously limits or compresses and performs one-way apparent noise reduction. No other stereo signal processor on the market can touch it for the price.

APPLICATIONS: Production and post-production sweetening; Processing noisy mixes; AGC and noise suppression for program feeds in broadcast or cable installations; Processing noisy STL feeds and down-link program sources; May be coupled for stereo operation or used as 2-channel device.

PACKAGE: 3.25"X19" (482mmX2u) rack mount enclosure

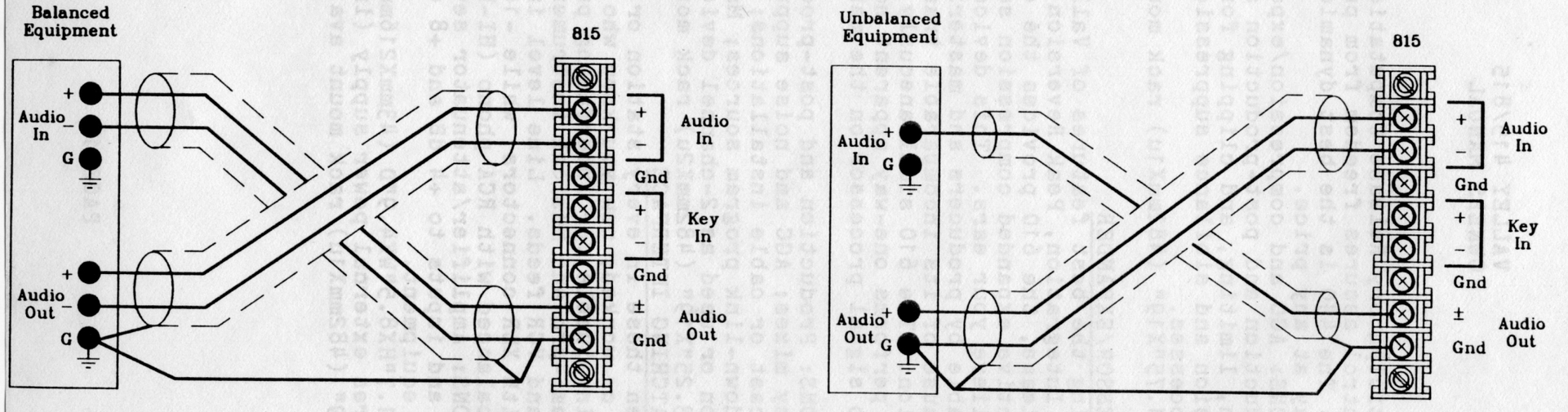
HH2X2B LEVEL MATCHING INTERFACE

You've seen these in every station or studio in which you've visited or worked; now you know who makes them! The HH2X2B is invaluable for interfacing professional equipment to semi-pro and musical instrument electronics, as well as CD and VCR feeds. Line level inputs and sources are balanced with XLR connectors, while -10 dB inputs and sources are unbalanced with RCA phono (HI-FI) connectors.

APPLICATIONS: Amplifier/attenuator set for connecting -10 dB sources and inputs to +4 dB and +8 dB recording and production equipment.

PACKAGE: 1.7"HX8.5"WX4.9"D (43mmX216mmX125mm) steel package. Requires external power supply (included with each unit). 1.75"X19" (482mmX1u) rack mount available for one or two units.

815 in TR-806


Balanced Equipment
Audio In
+
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G
Audio Out
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–
G
815
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–
Audio In
Gnd
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–
Key In
Gnd
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Audio Out
Gnd
Unbalanced Equipment
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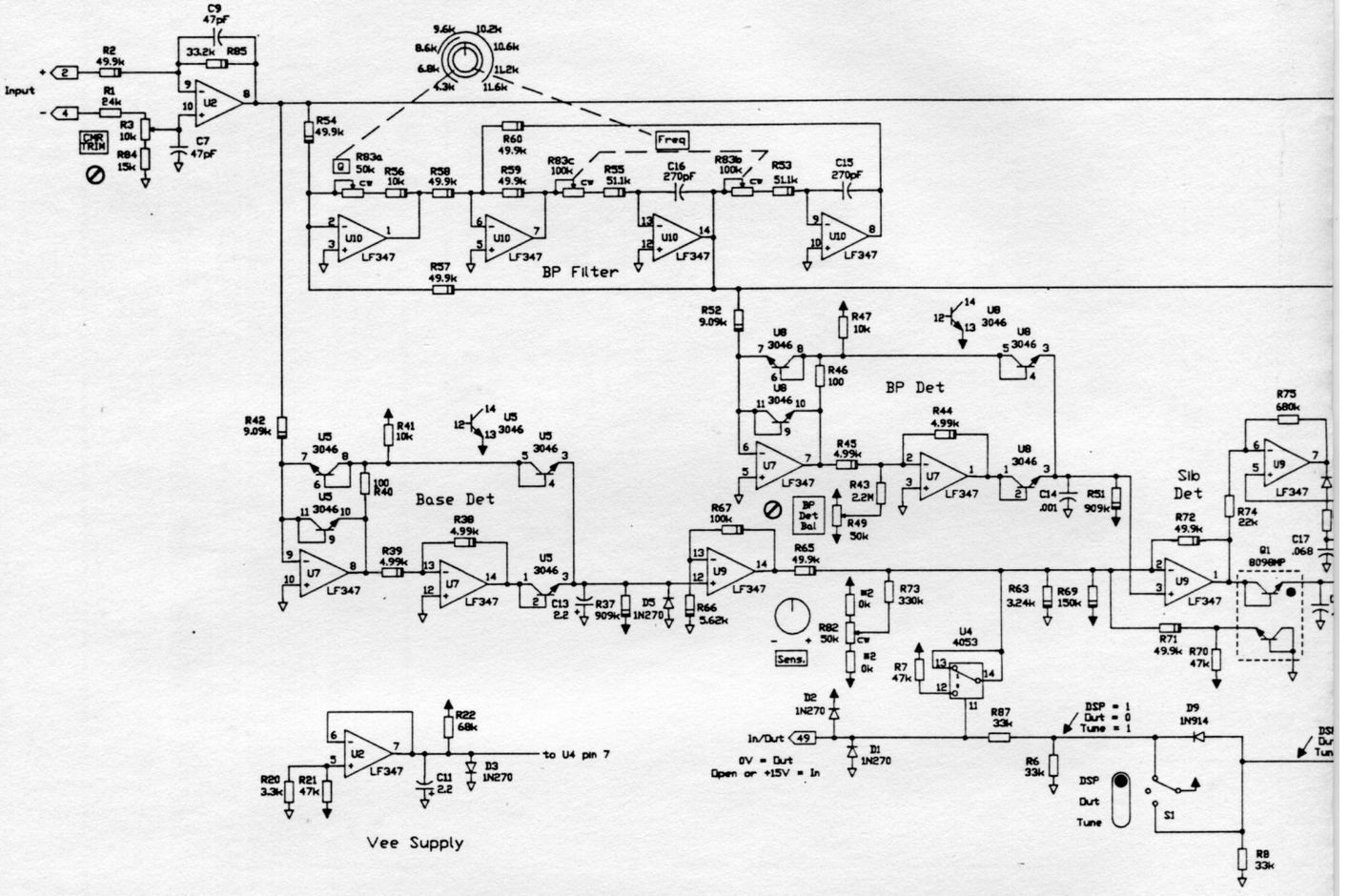
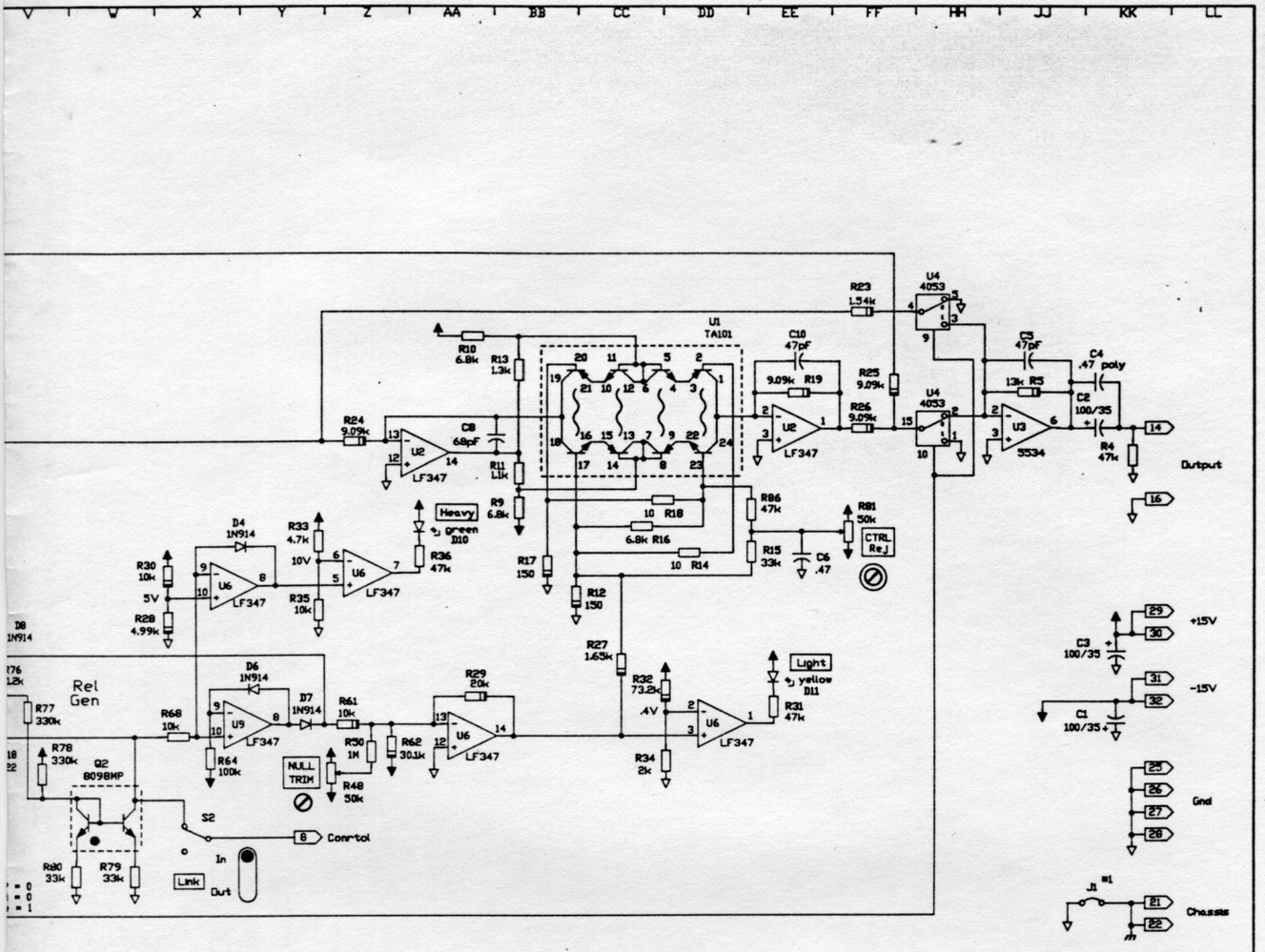


Notes:
- Resistance values in ohms unless specified
- Capacitance values in uF unless specified
- #1 Break J1 for separate signal and safety grounds
- #2 Optional Sens. range limit
- 1% metal film resistor
- 5% carbon film resistor
- +15V power
- -15V power
- Signal ground
- Safety ground

Electronic schematic
Schematic layer.
Labels layer
Special notes



REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	BY
	B	Freq range, Switch position	24 July 86	DTW

VALLEY

	DRAWN	CHECKED
BY	DTW	
DATE	24 Sept 85	

PROJECT Model 815

TITLE Schematic

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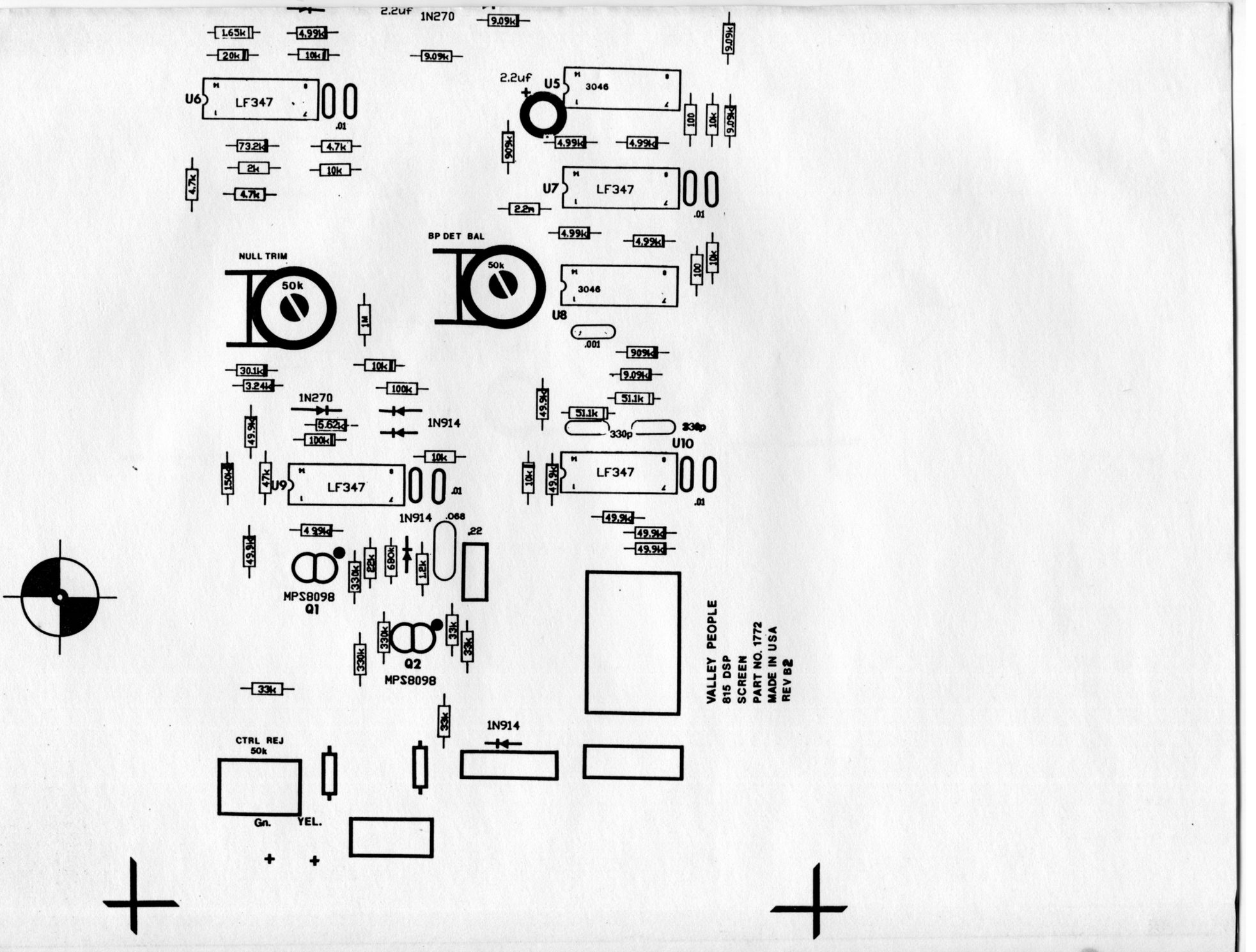
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Q2
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CTRL REJ
50k
Gn.
YEL.
VALLEY PEOPLE
815 DSP
SCREEN
PART NO. 1772
MADE IN USA
REV B2

Valley People Inc. Nashville, Tennessee					PROJECT 8'S 15 P
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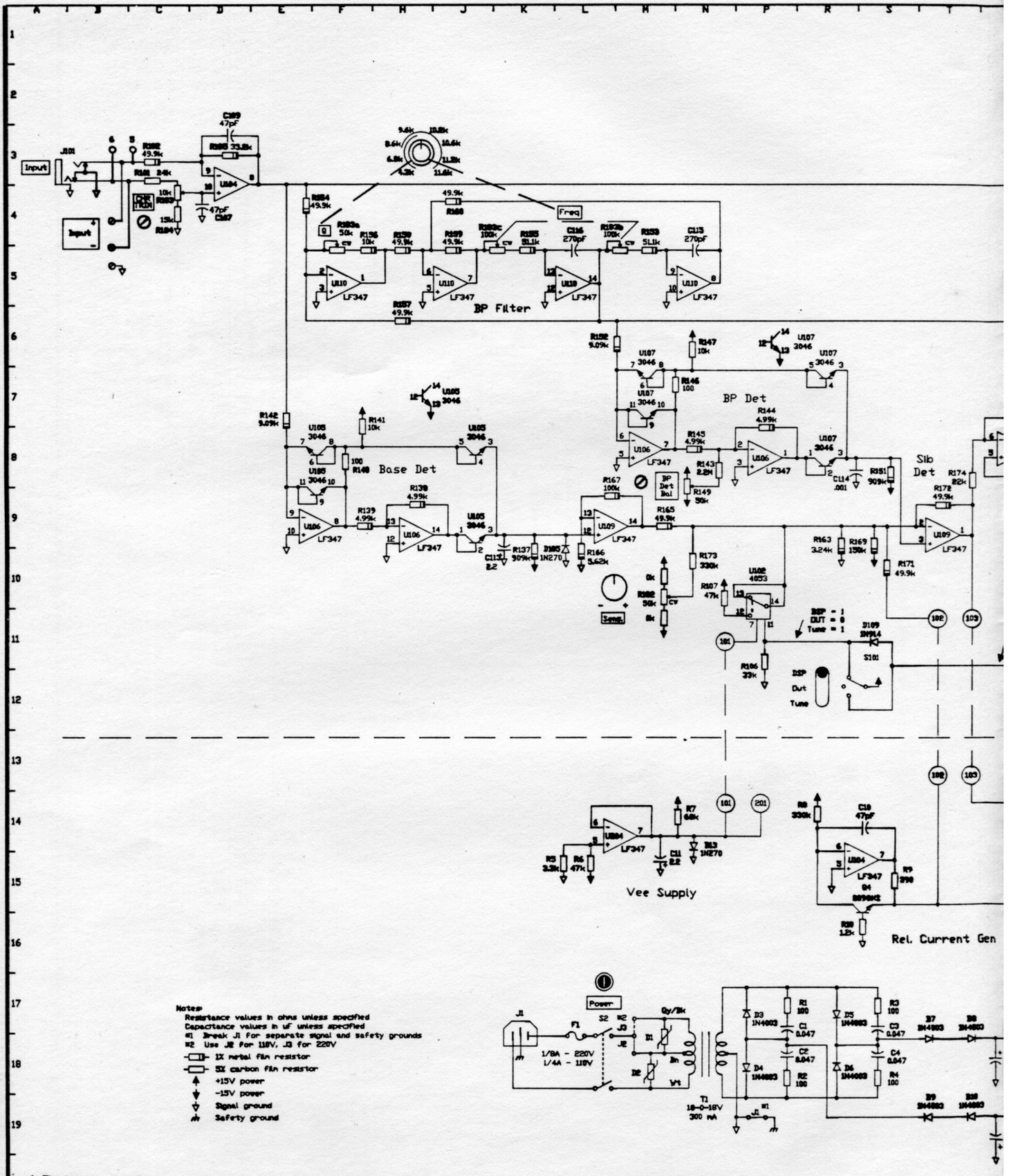
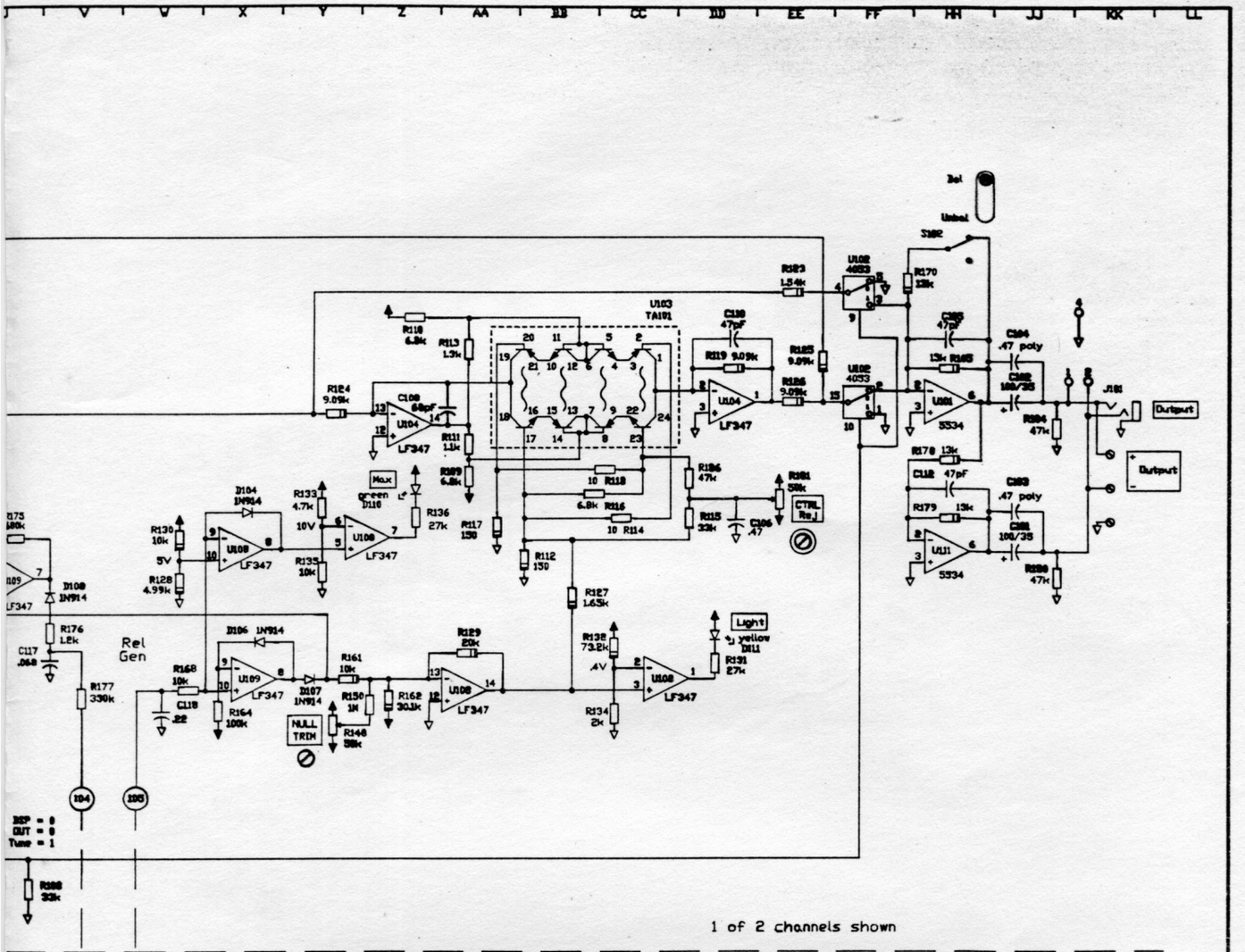


Notes
Resistance values in ohms unless specified
Capacitance values in uF unless specified
#1 Break J1 for separate signal and safety grounds
#2 Use J2 for 110V, J3 for 220V

1% metal film resistor
5% carbon film resistor
+15V power
-15V power
Signal ground
Safety ground

1 Electronic schematic
2 Schematic layer
11 Labels layer
23 Special notes



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D13, D110, D210

Missing:
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R220, R221, R222
C111, C211
D101, D102, D103
D201, D202, D203

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	C	Freq range, Switch positions, Part numbers	22 July 05	DTV

Valley People Inc.

BY	DTV	
DATE	5 Nov 05	

PROJECT Model 415

TITLE Schematic

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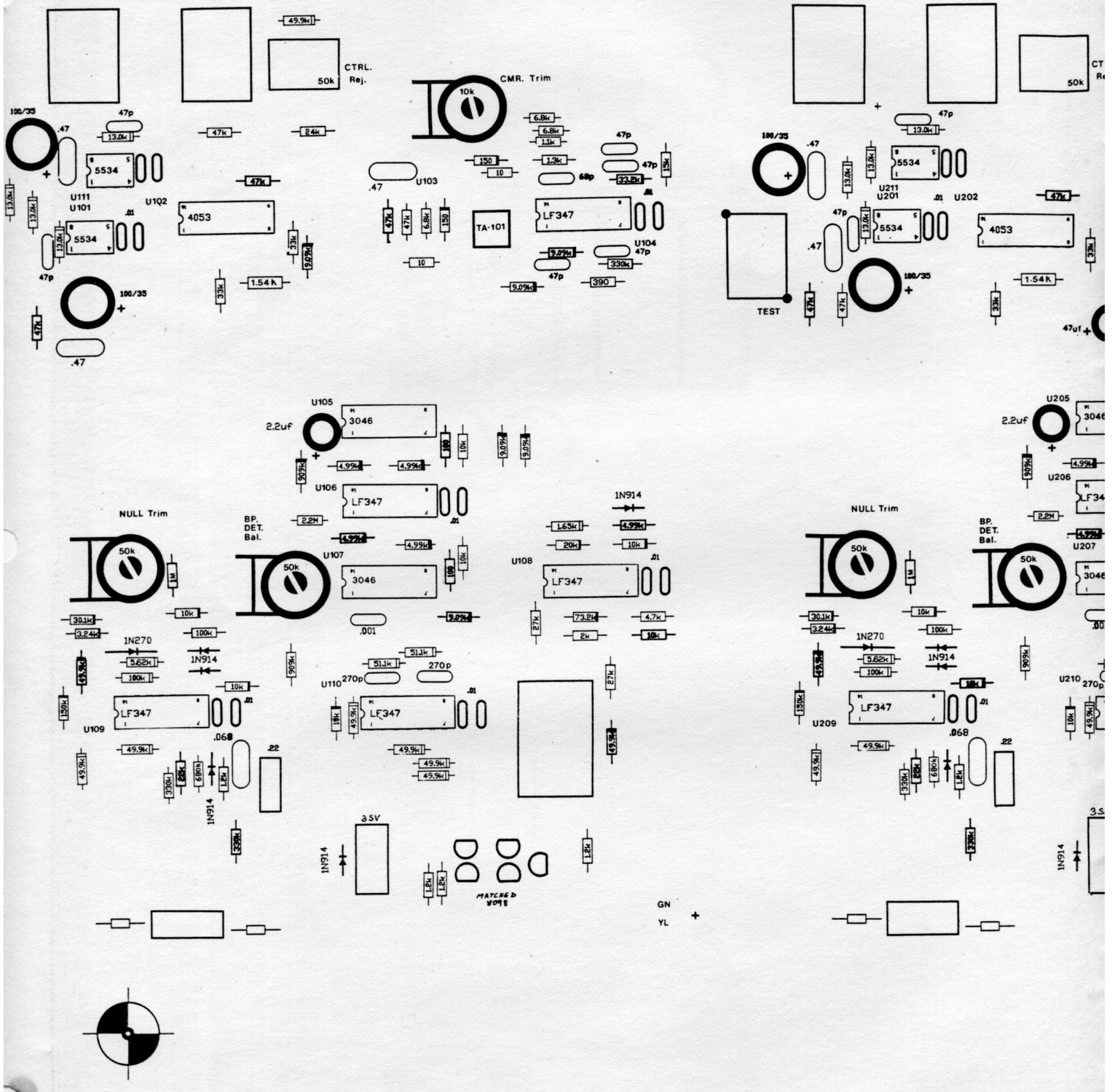
SIZE D REV. C

DRAWING NO. 1780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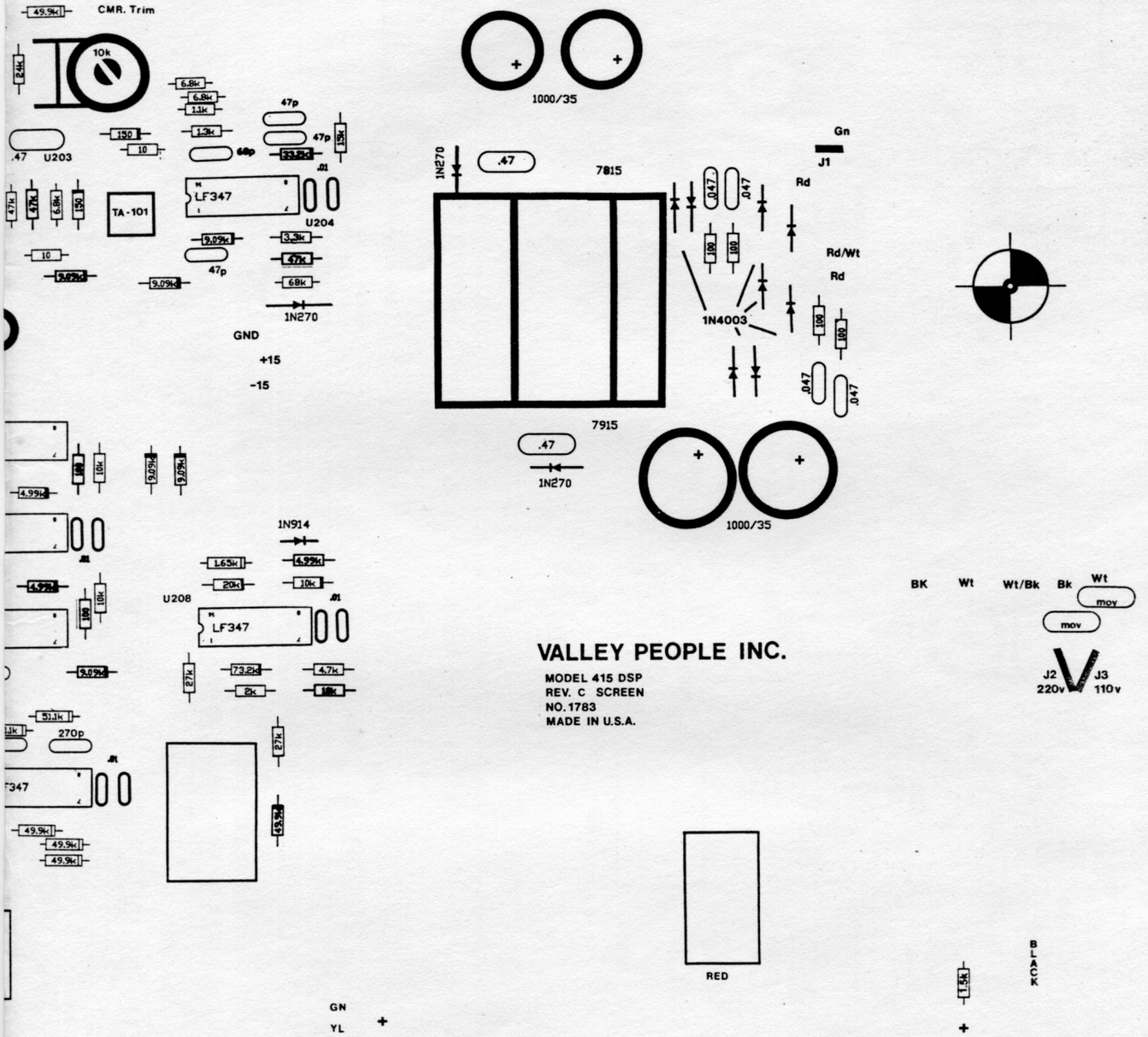

REV C 21 MAR 86 PBW
CORRECTED DIODE POLARITY NEAR J415

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BY	AC			
DATE				
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